An Analysis of the Housing Industry and the Determinants that Drive Housing Starts

C-424

A Thesis

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by

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This thesis is dedicated to my father, who instilled in me a great understanding and fascination with the housing industry.

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I would like to thank Professor Richard Murdock, who first presented me with the idea of undertaking a distinction project, and encouraged me throughout the process. I would also like to thank the various individuals who have taken time out of their schedules to speak with me: Bob Borowitz of M/I Schottenstein Homes, Hazel Morrow-Jones, professor of City and Regional Development, and Bob Bolander, who helped me with the Census data. Also, I appreciate the time spent by the review committee, and their insightful comments. Finally, I appreciate all the dedication and moral support that Lori Landrum has displayed throughout the entire project.

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Chapter 1 - Introduction

The residential home-building industry in the United States is a crucial industry to the national economy. In 1993, the single-family residential building industry accumulated $134 billion in sales of new houses, and total consumption expenditures on housing services was estimated to be $604 billion.[1] The general contracting industry employed over one million people in 1992, with an additional 2.8 million working as specialty trade contractors related to building, such as carpentry and plumbing.[2] Many more individuals make a living selling services and supplies to the builders.

The home-building industry is closely watched as an indicator of the state of the national economy. Every month, the U.S. Bureau of the Census publishes Current Construction Report C-20, which tracks total housing starts. Any fluctuations in this number are widely reported as an indication of a fluctuation in the general economy. Another important indicator is the national home-ownership rate, which also serves as a measure of the amount of people who have achieved the "American dream," that of owning their own home.

Given the importance of the housing industry, it has long been an object of research and speculation. Many different companies rely on the state of the housing industry, and many more individuals have a significant stake in the future of the industry.

But what determines the state of the industry? What factors really drive the production of new houses? This paper will examine the history of the housing industry,

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[1] Stanley F. Duobonis. "The Importance of Housing to the U.S. Economy." *Housing Economics.* April 1994. p. 6.

[2] The Unites States Bureau of the Census. Statistical Abstract of the United States. 1994. Table 1202.

noting trends in the economy and the population that have affected housing starts. Then, using factors that drive the number of housing starts each year, housing starts into the next decade will be predicted.

It is expected that a reasonable estimate of housing starts in the next decade can be determined with a model that analyzes the determinants of housing starts. Despite some predictions to the contrary, it is expected that housing starts will remain relatively stable throughout the next decade, even with changing demographics caused by the aging baby boomers.

Chapter 2 -Background to the Housing Industry

The Housing Industry

History of the Housing Industry

The home-building industry as we know it today has gradually evolved from the 1950's. The 1930's and early 1940's saw record low housing production due to the Depression and World War II. The end of the war, coupled with the G.I. Bill of Rights that guaranteed home loans to veterans, brought about a home-building explosion unlike any the country had ever seen, with production tripling from 1945 to 1946, and increasing through to the fifties.[1] Figure 2.1 charts the total number of housing starts from 1940 to 1995. The prosperity of the fifties continued to place heavy demands on housing. The automobile and the interstate system greatly reduced the amount of time it took to get into the central city, causing the rush to suburbia and the creation of "Levittowns," planned urban developments of small, affordable single-family houses.

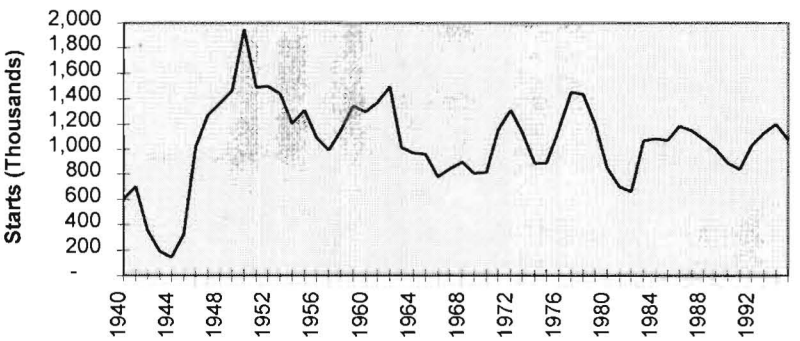

Figure 2.1: Number of housing starts in the U.S., 1940 - 1995.
Source: US Bureau of the Census Current Constrution Reports C-20

[1] Joseph B. Mason. History of Housing in the U.S. 1930-1980. (Gulf Publishing Company: Houston, 1982) pp. 45, 47.

High production levels and the standardization of houses created economies of scale, and production increasingly relied on pre-fabricated materials, such as fully built cabinets and doors. This was an era when many building companies started to grow larger, and the ideals of American suburbia were first implemented. However, the event of this decade which would have the most far-reaching implications for the housing industry, as will be explained later, was surge in the number of births known as the baby boom.

In the 1960's, builders started tapping Wall Street for equity sources, and thus, "building giants" started to emerge.[2] The giants started to reform the image of the industry from that of carpenters to that of businessmen. The industry continued its trend away from customization and toward standardization and the use of pre-fabricated materials.

The 1970's brought about political and economic turmoil, such as the Vietnam War, the OPEC oil embargo, and soaring interest rates. Despite these problems, the industry remained relatively strong throughout the decade. Housing starts remained strong, albeit there were a few lean years when the interest rates increased. The value of housing soared, and consumers viewed investment in a house as a hedge against inflation.[3] The baby boomers first started entering the housing market during this decade, which kept the demand and the value of houses high.

The federal bailout of the thrift industry in 1989 and the subsequent regulation of residential building and development caused more consolidation in the industry. Banks

[2] Ibid. p. 99.

would not lend the money required for new projects, so companies either merged with other companies or looked to Wall Street for capital. After a few years of tight money, however, banks are now providing construction firms with the capital that they need, and consolidation has slowed down.[4]

Current Status of the Industry

Perhaps the most intriguing aspect of the home-building industry today is the high level of segmentation experienced by the industry. There have been no "Wal-Marts" or "Home Depots" coming in and taking over the industry; a vast majority of houses are still built by small builders. In *Professional Builder's* most recent "Annual Report of Housing's Giants," the 400 largest residential construction companies together accounted for only 19.9 percent of all housing starts in 1995.[5] Pulte Home Corporation topped the list with 12,456 homes started, accounting for less than one percent of the total national starts of 1,347,000 units.[6]

The questions concerning the industry structure are: Why haven't the giants taken over, and will the giants take over anytime soon? There are a couple of factors that have led to the current shape of the industry. Perhaps the most important factor is the amount of work completed by subcontractors. Very little work is completed by the general contractor; most of the work is contracted out to subcontractors. M/I Schottenstein Homes in Columbus, Ohio (number 20 on *Professional Builder's* list with sales of $515

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[3] Ibid. p. 137.
[4] "How Big Can They Get?" *Builder Magazine.*
[5] "The Giant 400." *Professional Builder.* Volume 61, Number 6. April 1996. p. 101.
[6] Ibid. p. 102.

million and 2,950 starts[7]) estimates that its employees perform only about 5 percent of the work completed on a house, with the remaining 95 percent completed by subcontractors.[8] A contractor, essentially, acts as a scheduler, timing the production of each subcontractor in an effort to complete the house. He/she must plan for the framer to come for one week, schedule an inspection when the framer finishes, and schedule the roofer and plumber as soon as the framing passes inspection. Because all the work is completed by other companies, the contractor does not need many employees or capital equipment to start a company. In fact, an individual needs very little capital to enter the industry beyond a construction loan for the houses that he/she is constructing.

Another factor limiting the size of the giants is diversification of risk. A large market share in one area can be dangerous because the firm is so reliant on the local economy. For example, construction companies that had operations solely in Akron, Ohio, would have experienced extremely hard times when the rubber companies started moving out of the city in the 1960's. However, if the company had operations in Charlotte, NC also, the growing city could have helped alleviate the effects of the declining city.

Once a company maintains a set market share in an area, future growth must come from other areas to ensure adequate diversification. The appropriate level of market share is arbitrary and open for discussion; U.S. Home (number 6 on *Professional Builder's* list[9]) does not desire a market share of over 10 percent,[10] while M/I Schottenstein Homes

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[7] Ibid. p. 108.
[8] Bob Borowitz, estimator for M/I Schottenstein Homes. Personal Interview on July 8, 1996.
[9] "The Giant 400." p. 108.

enjoys a 25 percent share of the Columbus market.[11] Regardless of the guidelines of each company, firms reach a level of market share in an area and then must expand into new markets to attain future growth. This works to disallow any one company from controlling one market.

For a long time, people have been pondering when the giants are going to take the industry over, and making predictions that mass consolidation is coming soon.[12]

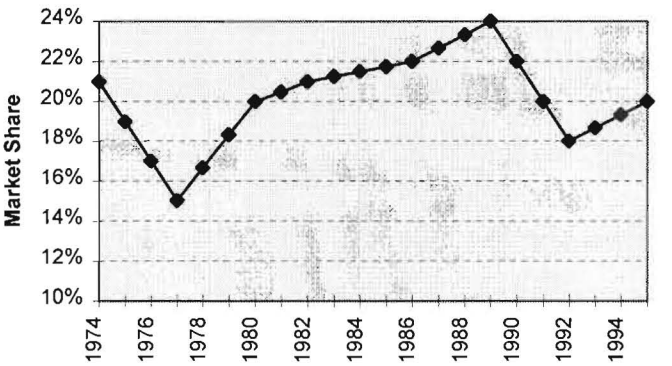

Fig. 2.2:Market share of 400 largest builders from 1974 to 1995. *Source: Housing Economics, February 1994, p. 7.*

However, there is no evidence to indicate that the giants will take over anytime soon. Figure 2.2 shows the total market share controlled by the largest 400 builders, taken from *Professional Builder's* Giant 400 lists. (Note: data from only 1974, 1977, 1980, 1982, 1986, 1990, 1991, 1992, and 1995 were available. Data for the remaining years were computed assuming linear market share growth and loss between these years. The graph is included for presentational purposes only). Although the chart shows increased market share from 1978 to 1988, the economic environment then reduced the share of the giants. The market share over this time period does not indicate a significant trend towards market dominance by the giants.

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[10] "How Big Can They Get?"
[11] "Local Leaders" *Builder Magazine.*

Furthermore, the issues that cause market segmentation are not issues that one company can resolve to become the dominant player. A firm cannot change the industry to increase the barriers to entry, nor can it diversify within the home-building industry without expanding into new geographic areas. Because these issues cannot be resolved, further analysis in the building industry centers on the change that occurred in the industry as a result of changes in the demographic structure of the country.

The Demand for Housing

An important factor in analyzing the housing industry is the demand for housing. Although there is a multitude of conditions that affect the industry, satisfying the demand is the goal of any builder. The successful builder is the one who foresees the needs of the purchasing portion of the population, and creates a product that will satisfy this need. There are numerous academic articles that discuss the current and future demand for housing in the U.S. Perhaps the most intriguing, however, came from two Harvard economists, N. Gregory Mankiw and David N. Weil.

The Mankiw-Weil Model

Mankiw and Weil "scared the bejesus out of the housing industry" when they published "The Baby Boom, the Baby Bust, and the Housing Market" in 1989.[13] In the article, Mankiw and Weil predicted a 47 percent decrease in the real value of housing in the U.S. by the year 2007. They extracted data from the 1970 Census of 53,518 households to determine the average value of housing occupied for each individual age.

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[12] James D. Carper. "Giants, Small Builders, the Future." *Professional Builder*. Volume 61, Number 6. April 1996. p. 9.

They took the value of housing in which individuals at every age lived in to be equal to the value of housing demanded for that age. The results of this research are charted in Figure 2.3. The research indicated that demand for housing is low until a person reaches about 20 years of age. At that point, the demand shoots up sharply until it reaches its peak at about 40 years, and then declines by one percent a year, on the average.

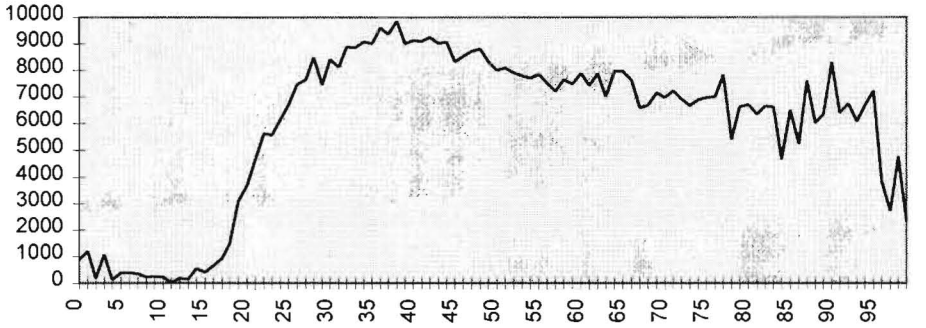

Fig. 2.3: The Cross-sectional Estimates of Housing Demand by Age
Source: Mankiw and Weil, "The Baby Boom, the Baby Bust, and the Housing Market."

Using this equation, Mankiw and Weil could project the demand for housing by multiplying the number of individuals at each age in a given year by the average value of housing demanded for that age. The sum of the demands for all the ages gave the aggregate housing demanded for that year. In charting the demand using this equation, Mankiw and Weil found a large increase in the demand for housing during the 1970's. This occurred because baby boomers were in their twenties and early thirties, which is the time period when individual demand for housing increases significantly. The amount of housing demanded continued to increase as the boomers edged closer to forty, their peak housing consumption years.

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[13] Hazel Morrow-Jones, Professor of City & Regional Planning, Ohio State University. Personal interview

Next, Mankiw and Weil discovered a "strong and highly significant relation between housing demand and the real price of housing." Given this relation, they could apply this data to what happened with the value of housing in the 1970's and what will happen in the future. The incredible demand caused by the boomers in the 1970's drove up the price of housing over the decade. However, as the nation entered the nineties, demand for housing would decrease as the large number of people in the baby boom entered the part of their life where housing demand decreased yearly. Furthermore, in the years after the baby boom, America went through a "baby bust," where births declined until bottoming out in 1973. Demand for housing would decrease further in the 1990's because of the decline in the number of people entering the home-buying years (those born 20 to 30 years earlier).

The result of this research showed an overall decline in the national demand for housing, resulting in a sharp decline in the value of housing. The authors predicted that "the housing boom of the past twenty years will more than reverse itself in the next twenty." Real housing prices, they predicted, will fall by about 3 percent each year, for a total of a 47 percent decline by the year 2007.[14] In fact, Figure 2.1 shows that housing starts have actually increased in the 1990's. Also, Figure 2.4 charts the median sales price of existing houses in the U.S. from 1989 to 1995, adjusted for inflation. The chart shows that the value of housing in the U.S. has actually increased over the time period,

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at Ohio State on July 17, 1996.

[14] N. Gregory Mankiw and David N. Weil. "The Baby Boom, the Baby Bust, and the Housing Market." *Regional Science and Urban Economics*, Volume 19, 1989. pp. 235-258.

despite a decline in 1990. The decrease in demand and value that Mankiw and Weil predicted have not come to pass. What happened?

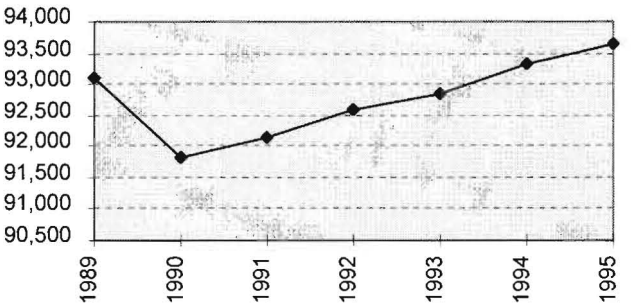

Fig. 2.4: Median Real Sales Price of Existing Single-Family Homes, 1989 to 1995 Source: Statistical Abstract, 1995

The Baby Boomers

Perhaps Mankiw and Weil's biggest mistake was assuming that the baby boomers would act exactly like their parents. In fact, the boomers are very different from their parents. The boomer generation is known for its skepticism, its rejection of the status quo, and its consumerism.[15] The boomers were raised to feel a sense of individualism, and were employed in a work environment that rewarded competitive spirit. Perhaps more importantly, the boomers were raised in the post-war affluence that America experienced, and their parents indulged them as no generation had been indulged before.[16]

Analysts have misjudged the boomers before. Take, for example, coffee. History shows that, as people get older, more individuals generally tend to drink coffee. Therefore, analysts expected a significant increase in the percentage of people who drink coffee as the boomers aged, from the current 57 percent to about 60 percent. However,

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[15] Patricia Braus. "The Baby Boom at Mid-Decade." *American Demographics.* Volume 17, April 1995. p. 43.

[16] Cheryl Russel. "The Master Trend." *American Demographics.* Volume 15, October 1993. p. 30.

forecasters did not realize that many boomers prefer to get caffeine from soda instead of coffee, and did not change their habits as they got older. The percentage of individuals who drink coffee actually fell to 53 percent as the boomers aged. Ever the conspicuous consumers, boomers have willingly purchased *upscale* coffees despite the overall downward trend, allowing coffee houses like Starbucks' to grow tremendously.[17]

It is possible that baby boomers have simply rejected their parents' ideals and have continued spending more on housing as they age. The Mankiw-Weil model assumed that the baby boomers would follow the consumption patterns of the older generation with regards to housing, which they have not done in most other areas. Like the coffee example, the boomers that have purchased housing in the 1990's may have purchased more expensive housing. This might cause the demand and value of housing to increase, even with a decrease in the overall number of individuals purchasing new housing.

The Mankiw-Weil predictions caused an uproar in the housing industry, and attracted a significant amount of attention. As such, several authors wrote responses to the article. Craig Swan argued that Mankiw and Weil's prediction was caused by a "misinterpretation of the demand variable," and that the variable they used is essentially a "measure of demography."[18] Swan maintains that other demand variables must be introduced to the equation, such as real income, relative prices, and real interest rates.[19]

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[17] Michael Sivy. "Cashing In on the Middle-Aging of America." *Money.* Devember 1995. p. 102.
[18] Craig Swan. "Demography and the Demand for Housing: A Reinterpretation of the Mankiw-Weil Demand Variable." *Regional Science and Urban Economics.* Volume 25, 1995. p. 55.
[19] Ibid. p. 41.

Mankiw and Weil could not have predicted the economic conditions that drove the housing industry in the 1990's. Interest rates plummeted, causing a surge in refinancing and purchasing of new houses. The economic conditions of the 1990's may have disrupted the Mankiw-Weil model.

The premise of the Mankiw Weil equation is that population is the primary variable affecting the demand for housing. Given that population is the primary variable, much of the history and predictions about the future of the industry can be determined by analyzing the movements of the baby boom. The boomers are currently heading into the middle of their peak earning years, and account for a majority of the nation's purchasing power.[20] Any marketer would realize the potential that the baby boom holds, and closely watch the trends set by the boomers.

Population, and the baby boom in particular, are important indicators of the demand for housing. The housing supply can be expressed as the number of households multiplied by the home-ownership rates for householders, as computed by the U.S. Bureau of the Census. Obviously, the population is directly responsible for the number of households. Changes in either the number of households or the home-ownership rates changes the housing needs of the country.

Given that the owner-occupied housing demanded for any year is made up of the number of households and the home-ownership rates, the number of owner-occupied houses can be estimated by multiplying these two values across age ownership data. The number of housing units demanded can then be estimated by subtracting last year's

supply from the current year's supply. Assuming a correlation between the two values, the housing demand for the future can be estimated. Household projection information is provided by the U.S. Bureau of the Census, and home-ownership rates can be estimated into the future by looking at the trends of rates in the past.

This information would give insights regarding the number of owner-occupied housing units put into place in a year. It would not indicate the value of the housing put into place, nor would it indicate the value of existing housing. However, it is much easier to predict the increase in housing units, and requires fewer assumptions than the Mankiw-Weil equation. It is hoped that, while the information might not be as informative, it will be more accurate.

It is expected that the reduction in demand predicted by Mankiw and Weil will not transpire. Although the baby boomers are getting older, their consumption trends do not follow the older generation's. As they enter their peak earning years, many may move into a different house, opening up housing stock for the younger generation to purchase. The demand for vacation and second homes will most likely increase dramatically as the largest population bulge starts to think about retirement. Also, the second baby boom, the boomers' children, will start entering the housing market in the next few years, purchasing either new houses or the old houses that the boomers moved out of.

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[20] Judith Lynne Zaichkowsky. "Consumer Behavior: Yesterday, Today, and Tomorrow." *Business Horizons.* Volume 34. May-June 1993. p. 56.

Chapter 3 - Estimating the Demand for Housing

The total number of housing units can be estimated relatively easily. The country is made up of households, and a count of the total number of households would indicate the total number of housing units. By definition, a household must live in a housing unit. However, only a certain percentage of individuals own their primary residence. As such, the total number of owner-occupied housing units could be quantified as:

$$OOHU = HH * HOR \quad (1)$$

where:

OOHU = Total number of owner-occupied housing units

HH = National total number of households

HOR = National home-ownership rate.

This equation could be further broken down into the rates for each age. For example, the total number of owner-occupied housing for individuals aged 25 could be:

$$OOHU_{25} = HH_{25} * HOR_{25} \quad (2)$$

where:

$OOHU_{25}$ = The total number of owner-occupied housing for individuals at the age of 25

HH_{25} = The total number of households headed by an individual who is 25

HOR_{25} = The home-ownership rate of 25-year olds.

The total national number of owner-occupied housing for year 19XX is calculated as the sums of the total amounts within each age level:

$$OOHU_{19XX} = \sum OOHU_j \quad (3)$$

This equation gives an estimate of the total supply of owner-occupied housing for the year 19XX. However, it does not give an indication of the total housing supply for the year. One problem exists because some households own two houses, and the equation does not apply to occasional use or vacation homes. Say, for example, that a household owns their primary residence, and this year purchase a winter home in Florida. Although the supply of housing increases with the purchase, this equation does not reflect this increase because the overall home-ownership rate remained the same. A similar equation could be comprised which indicates the housing supply for occasional use dwellings:

$$OUH = \sum OHU_J \qquad (4)$$

where:

OUH = The number of occasional use housing units

$\sum OUH_J$ = The sum of the supply for occasional use housing units at each age level

These equations could be applied to different years to generate a trend in the supply of owner-occupied housing. The difference between any two years represents a change in the supply of housing.

$$\Delta OOHU_{1995} = OOHU_{1995} - OOHU_{1994} \qquad (5)$$

and

$$\Delta OUH_{1995} = OUH_{1995} = OUH_{1994} \qquad (6)$$

Changes in the supply come in two forms: new housing constructed and housing destroyed, such as by fire or flood. Therefore, the value of ΔTHU_{1995} could be rewritten as:

$$\Delta THU_{1995} = HC_{1995} - HD_{1995} \quad (7)$$

where:

HC_{1995} = the number of new houses (both owner-occupied and occasional use) constructed in 1995

HD_{1995} = the number of owner-occupied and occasional use housing units destroyed in 1995.

Another problems with the data regarding the number of housing units produced is that it does not include mobile home shipments. These units are included in the home-ownership rates, but not in the housing constructed data, and must be added into the equation. Substituting the previous determinants of ΔTHU into this equation, the estimate of new homes constructed in 1995 can be thus estimated:

$$HC_{1995} = \Delta OOHU_{1995} + \Delta OUH_{1995} + HD_{1995} + MH_{1995} \quad (8)$$

Where:

MH_{1995} = The number of mobile homes shipped in 1995

Therefore, the number of new houses constructed in a given year can be estimated by the change in the supply of owner-occupied housing as a reflection of the change in the number of households and a change in home-ownership rates, plus the number of occasional-use housing constructed, plus the number of owner-occupied housing units destroyed, plus the number of mobile home shipments. Given this equation, the number of houses to be constructed in the future can be predicted by estimating the number of households and the home-ownership rates, the number of houses destroyed, the expected demand of occasional-use housing, and the expected number of mobile home shipments.

This model could be applied into a regression equation to predict the number of housing starts over the next decade.

It should be noted that the value of HC is not necessarily a measure of demand; it is essentially a measure of the change in supply. However, for purposes of this study, the two are assumed to be approximately the same. It is assumed that, because of the large number of construction companies offering a broad array of products, a consumer's demand can be adequately met in the market in a timely manner. For the duration of the study, any references to demand will actually be represented by the yearly change in housing supply.

This study is more interested in the average number of units demanded over the next decade than single-year fluctuations in production. It would be impossible to predict the variables that would affect the number of housing units started in any one year. An important variable, the mortgage interest rate, is entirely out of the hands of any market forces. It is assumed that the general demand for housing remains relatively stable over time, and is primarily related to the demographics of the population. An unusually low production in one year caused by, say, extremely high interest rates will be fixed in the following year with unusually high production when the interest rates return to normal. Rather than study the unusually high or low production levels, this research is more interested in the average of the two.

Another variable that the equation does not take into account is new housing inventory, and any changes in the inventory levels that might affect the occupied housing supply. Vacant housing is usually houses that are for sale, but not yet sold. There will

always be a supply of housing for sale in the country. Over the past thirty years, the homeowner vacancy rate has only fluctuated between 0.9 percent and 1.9 percent, and there were no yearly fluctuations greater than 0.2 percent. In the last decade, the rate has consistently been between 1.4 percent and 1.9 percent.[1]

Although housing inventory will affect the number of housing units constructed in the short term, it would not significantly affect housing starts in the long run. Builders may slow production in one year if the inventory is too high, lowering sales for new houses. However, the builder could make up the sales in the following year, as the inventory supply is lowered and consumers demand additional new housing. Assuming that the demand for housing does not change radically year to year, inventory levels will not significantly affect the average units produced over a time period.

[1] US Bureau of the Census, "Rental and Homeowner Vacancy Rates for the United States: 1960 and 1965 to 1996." Housing Vacancy Survey

Chapter 4 - Predicting Housing Demand

Part One: Historical Housing Demand Determinants

Household Information

The first portion of the research involved obtaining information regarding the composition of households in the U.S. All household information was obtained from the U.S. Bureau of the Census (USBC). The USBC defines a household as "the person or persons who occupy a housing unit (i.e., house or apartment)."[1] According to this definition, the total number of households should equal the total number of housing units. A household includes "the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit."[2]

Households are separate from group living quarters, which are not counted in the household population. Group living quarters include institutions, jails, hospitals, rest homes, college dormitories, or military barracks. Households are classified by the status of the householder. The householder is the "first adult household member listed on the questionnaire." The Census questionnaire asks individuals to list first the person in whose name the house is owned or rented, and is usually the husband or wife of the household. Before 1980, the husband was always considered to be the head of the household for married couples.[3]

The primary figures concerning population and household status come from the decennial census. Every ten years, the Census Bureau completes a count of every individual and household in America. While the population count, which includes

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[1] US Bureau of the Census, Current Population Reports, P20-447, p. 1.
[2] US Bureau of the Census, Statistical Abstract of the United States, Definitions.
[3] Ibid.

information on race, age, sex, family relationships, goes out to everyone, about 17 percent of the population receives the "long form." The long form includes more specific information regarding social status, housing characteristics, and economic status.[4] The data from the long form are then multiplied out to account for the entire population. Because the population for the Unites States is so large, 17 percent is considered to be a very large sample, and is considered highly relevant.[5]

The Census Bureau also employs a Current Population Survey (CPS), which performs monthly population surveys. The CPS contains a sample that includes 729 areas, made up of 1,973 counties, independent cities, and minor civil divisions, and covers all fifty states. There are approximately 60,000 households that are eligible for interview every month. The CPS has a higher sampling error than the decennial census because of the lower sampling rate.[6]

Using the decennial census as the benchmark for population and household counts, the years in between census years are estimated using information from various sources. Population trends are obtained from the CPS. For example, the CPS follows the trends relating to household formation, and uses these trends to estimate the total national number of new households formed. The Census Bureau also obtains information from other government agencies to form annual estimates. Birth and death information is obtained from the National Center for Health Statistics, and immigration information is

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[4] Ibid.

[5] Bob Bolander, The Ohio State University Census Information Retrieval Specialist, personal interview on July 10, 1996.

[6] US Bureau of the Census, Statistical Abstract of the United States, Definitions.

obtained from Immigration and Naturalization Services.[7] USBC household and population information is deemed to be appropriate for this study.

Information regarding the number of households in the country were obtained from the USBC Statistical Abstract of the United States, which compiled household information from the Current Population Reports, P20-447, and other earlier reports. The Statistical Abstract gave total households by age for the years 1970, 1975, 1980, 1985, 1990, and 1994. The chart is exhibited in Table 1 of the Appendix. The original table gave the number of households in millions, and these values were multiplied out to give households in thousands to make it similar to other data. Because this information was not in the form that was desired, the format of the data was modified to fit other informational resources.

One problem with the data was the composition of the age groups. The age groups were given by increments of 5 years until the age of 35, and then was given in increments of 10 years. For example, the table gave the total number of households for householders aged 30 to 34 years of age, then gave the total number of households for householders aged 35 to 44 years of age. The home-ownership rates were given in age increments of 5 years. Rather than modify the home-ownership rate information, it was believed that more accurate data could be obtained by breaking down the household information into 5 year increments.

Breaking down the data required total population information. The Census breaks down the resident population counts into 5 year age increments across the entire population. Table 2 in the Appendix shows resident population by age for the years

[7] Ibid.

1970, 1975, 1980, 1985, 1990, and 1994. Census data for population are counted at the decennial census and estimated for other years using the same methods as that for households described earlier. The Statistical Abstract of the United States, which was the source for the data, did not give data for 1975. 1975 data was computed by assuming a linear growth from 1970 to 1980. This is probably a strong assumption, but any errors should not significantly affect the results. This adjustment is merely changing the ratios between different age groups, and there is not a large difference between the home-ownership rates in these two age groups anyway.

The dispersion of householders within any 10 year age group was assumed to be the same dispersion as two five-year age groups of the population. In this way, the percentages of population of different 5-year age groups from the resident population table could be applied to extract data out of the household information. For example, in 1994, the total population of residents (in thousands) aged 35 to 44 was 41,660, with 21,961 aged 35 to 39, and 19,699 aged 40 to 44. Therefore, the age group of 35 to 44 year olds in 1994 was made up of (21,961/41,660) 52.71 percent of people aged 35 to 39, and (19,699/41,660) 47.29 percent of people aged 40 to 44.

The number of householders in the age group of 35 to 44 in 1994 was 22,300. By applying the percentages of population for each 5 year age group, the number of households headed by individuals aged 35 to 39 is (22,300 * .5271) 11,754 households, while the number for householders aged 40 to 44 is (22,300 * .4729) 10,546 households. This computation was completed for each age group that gave 10 year increments (35 and older) for every year on the chart, and the resulting number of households for each age group is displayed in Table 3 in the Appendix.

It is noted that this method of computing the 5 year age groups of households makes a strong assumption. It assumes that the head-of-household rate is the same within the two five year age groups for each ten year age group. The percentage of the population who are householders in the 40 to 44 range may be higher than in the 35 to 39 range, because a higher percentage individuals may head households as the population gets older. Also, there may be more single-parent heads of household in the higher age group, as more individuals may get divorced as the population ages. The differences, however, would be most significant in the younger age groups when most households are formed. There is probably a difference between the 25 to 29 age group and the 30 to 34 age group that might be noticeable. This computation was not necessary at these age levels, because the Census household information had already broken down households into these levels. At the higher age levels, the difference would not be as notable. Although this method is not completely accurate, it serves as a reasonable estimate to predict housing demand.

Table 3 only gives the number of households for every five years from 1970 to 1994. Analysis of the housing demand for each year requires information for each individual year between these five year increments. Numbers for the years in between the five year increments were computed on Microsoft Excel using the "Growth Series" command. The growth series assumes a constant rate of growth for a series, rather than a linear growth. For example, households with householders aged 15 to 24 increased from 4,400 in 1970 to 5,800 in 1975. Rather than assuming a linear growth of 280 households per year (figured by taking the total increase of 1,400, divided by 5 years), the growth series assumes a growth rate of approximately 5.68 percent a year multiplied by the prior

year number of households. This results in an increase in the number of households of 250 in 1971, 264 in 1974, and so on.

A growth series between five year household increments is reasonable for purposes of this study. The number of households is a measure of population. Population growth for any period is based on the population of the prior period. Therefore, growth series is assumed to be an appropriate measure to use. Furthermore, because the series is only finding data between five year increments, the difference between linear and growth series is not great. In the example in the previous paragraph, the difference in the first year would have only been 30,000 households in 1971, and the difference would have decreased after 1971. Table 4 shows the annual total number of households in the Unites States from 1970 to 1994.

Home-ownership Rates

The home-ownership rates for the U.S. were easier to compile than the household information. Essentially, the household data were modified to fit the home-ownership rate data. The USBC compiles home-ownership and other housing information using a method that is very similar to the population surveys and the CPS described earlier. The decennial census serves as the benchmark, and the USBC conducts surveys of smaller samples to chart trends between decennial census years. In fact, the Housing Vacancy Survey, which follows vacancy rates among owner-occupied and renter-occupied housing, is completed in conjunction with the CPS.[8]

The American Housing Survey (AHS) is very similar to the CPS in that it follows housing trends between decennial census years, taking place every two years. The AHS

samples 394 areas, covering 878 counties and independent cities in all fifty states. The AHS that was completed in 1993 interviewed approximately 56,700 households.[9] The AHS publishes the Current Housing Reports series, from which home-ownership rates are obtained.

The USBC counts the total number of households and classifies these as either owner-occupied or renter-occupied. A housing unit is owner-occupied if the "owner or co-owner lives in the unit, even if it is mortgaged or not fully paid for." All other housing units are classified as renter-occupied. The home-ownership rate for any age group is the total number of owner households in that age group divided by the total number of households in that age group.[10]

Year	Rate	Year	Rate
1974	64.6	1985	63.9
1975	64.6	1986	63.8
1976	64.7	1987	64.0
1977	64.8	1988	63.8
1978	65.0	1989	63.9
1979	65.2	1990	63.9
1980	65.6	1991	64.1
1981	65.3	1992	64.1
1982	64.7	1993	64.0
1983	64.7	1994	64.0
1984	64.4	1995	64.8

Table 4.1: National Home-Ownership Rates, 1974-1995. Source: *National Association of Home Builders.*

The home-ownership rates for the years 1974 through 1995, as a total for the nation and broken down into age groups, are displayed in Table 5 in the Appendix. Table

[8] US Bureau of the Census, Housing Vacancy Survey, Second Quarter 1996, Source and Accuracy.
[9] US Bureau of the Census, American Housing Survey, Source and Accuracy Statement for the 1993 AHS-N Data Chart.

4.1 shows the national home-ownership rates for each year for the entire nation. The data in Table 5 did not include home-ownership rates for householders aged 15 to 24 for the years 1974 to 1981. However, this data could be extrapolated using the national home-ownership rates for these years. The home-ownership rate in this age group for 1982 was 19.3 percent. For each year before 1982, any percentage change in the national home-ownership rate was assumed to have taken place in this age group, also. For example, from 1981 to 1982, the national rate dropped from 65.3 percent to 64.7 percent, so the percentage change over this period was (.6/64.7), or 0.927 percent. The home-ownership rate for the under 25 age group is also assumed to have dropped in that period by 0.927 percent, from 19.5 to 19.3. It is assumed that the home-ownership rates for the under 25 age group follow the trends in the national home-ownership rates.

Simple multiplication of Tables 4 and 5 will give an approximation of the total number of owner-occupied housing units, or equation (1) from Chapter 2 for each year that household and home-ownership rates are available. Table 6 multiplies these two variables together and sums up the total approximate number of housing units demanded for the years 1974 to 1994. The annual increase is displayed in Table 4.2, on the following page. Table 4.2 is a summary of Table 6, and illustrates the last line of Table 6, showing the overall increase in demand (ΔOOHU) during the year.

[10] US Bureau of the Census, Housing Vacancy Survey, Definitions.

Year	Increase	Year	Increase
1975	1,143,551	1985	630,006
1976	1,298,757	1986	705,701
1977	1,147,234	1987	871,201
1978	1,531,432	1988	714,008
1979	1,552,600	1989	898,042
1980	1,488,437	1990	693,913
1981	428,442	1991	588,323
1982	461,402	1992	508,294
1983	568,500	1993	832,019
1984	871,185	1994	609,013

Table 4.2: Estimated Annual Increase in Home-owner Households.
Source: Table 6 of the Appendix

Housing Starts

Housing starts is the most appropriate measure of the additional demand for each year. The number of housing starts is a closely-followed number, as it serves as an important indicator of the national economy. Therefore, the USBC computes this value every month and publishes it in its Current Construction Reports, Series C20. A housing unit is considered to be started when excavation begins for the footings or foundation.

The USBC obtains data primarily from local government permit-issuing areas. Of the 17,000 permit issuing areas, the census selects approximately 840 to count, and adjusts this data to account for the nation. Also, Census field representatives canvass nonpermit areas monthly to account for starts in the areas that do not issue permits. Furthermore, research performed by the Census Bureau has indicated that 3.3 percent of

single-family houses in permit areas are started without a permit, so the sample is adjusted appropriately.[11]

Report Series C20 follows residential housing starts, and does not include group quarters, such as dormitories, hotels, and rooming houses.[12] This does not present a problem because home-ownership rate data are not affected by these dwellings.

The number of single-family dwellings is the measure of housing starts that the equation is to be tested against. Single-family starts should estimate the increase in the number of owner-occupied dwellings. A review of Census data reveals that, from 1974 to 1993, only 1.7 percent of the single family housing units built were intended for use as a rental unit, leaving the rest for owner-occupancy.[13]

Single family housing starts, as reported by the USBC, are exhibited in the first column of Table 7. An adjustment is required to make housing start information conform to the housing supply information. Once a house is started, it takes a few months for the house to be completed and enter the housing market. For the study, a four month lag is assumed as the average amount of time to finish a house once excavation has been started. This number varies; large houses tend to take more time, whereas smaller, more standardized houses could be finished in less time. However, the number of owner-occupied housing starts is adjusted to four months behind in the "Adjusted Starts" column of Table 7. This is accomplished by multiplying the current year's number by 2/3, and adding the prior year's number multiplied by 1/3.

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[11] US Bureau of the Census, Current Construction Reports, Series C20, Appendix.
[12] Ibid.
[13] Ibid.

Mobile Homes

A problem with housing starts is that they do not include shipments of mobile homes. The Census Bureau defines a mobile home as "a portable dwelling unit constructed to be towed on its own chassis and designed for use without a permanent foundation."[14] Therefore, modular homes, which are pre-manufactured and shipped to the site where they are permanently attached, are included in housing starts. Unfortunately, mobile homes are not, while they are included in home-ownership rates. The Current Construction Reports publish annual mobile home shipment information.

Statistical data on mobile homes are not readily available. Furthermore, the production of mobile homes has been very volatile in the past, and has proven to be difficult to predict. Production soared in the early 1970's, then fell dramatically at the same time single family production nose-dived.

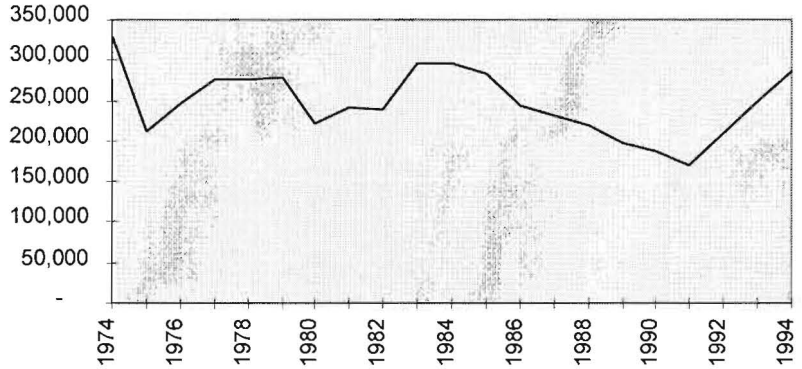

Fig. 4.1: Production of Mobile Homes: 1974 to 1994
Source: Current Construction Reports Series C20

Figure 4.1 shows the production of mobile homes annually from 1974 to 1994 (actual numbers are displayed in Table 8). But how is production of these units driven?

[14] Ibid.

Mobile home production is difficult to predict because of the buying trends of purchasers. Mobile homes depreciate, and are treated like a car by the banks, meaning that banks charge a higher interest rate than they would on a house. Some research has suggested that mobile homes are an inferior good; that is, as real personal disposal income increases, fewer people would be apt to purchase mobile homes.[15]

Morgan and Belknap have shown three determinants of the number of mobile homes produced: price variations between mobile homes and substitute housing types (mostly apartments), the availability of credit for financing mobile homes, and the interaction of price and credit effects. The interest rate for mobile homes, the number of households formed over the age of 65, and the vacancy rate for single family housing were also found to affect the production level.[16] The historical numbers of mobile homes shipped was tested against demographic data to determine if shipments were correlated to the number of new households over the age of 65.

In Table 8, the annual numbers of homeowner households in the 65 to 74 and 75 and older age ranges were taken from Table 6 and added to get total homeowner households over age 65. The prior year was then subtracted from the current year to get the increase in homeowner households over age 65 for each year. A correlation was run on Microsoft Excel to test the relation between the number of mobile homes shipped and new households over the age of 65. With a correlation of only 0.1063, the two variables

[15] W. Douglas Morgan and Andrew Belknap, "The Determinants of Mobile Homes Shipments: Time Series Evidence," *Business Economics*, May 1982, p. 31.
[16] Ibid. p. 36

are not statistically significant. The number of new homeowner households over the age of 65 is not a good indicator of the number of mobile homes produced.

However, based on the research, the number of mobile homes shipped might be a decent indicator of the economic indicators that would affect homebuying. Mobile home shipments are driven by a mixture of the credit availability and relative price variations between substitute products.[17] As demonstrated above, sales of mobile homes are not highly correlated with demographic data, as the independent variable ΔOOHU is. It is believed that shipments of mobile homes would indicate economic variables that the demographic data might not pick up. For example, if interest rates fall, both mobile home shipments and housing starts would tend to increase. Therefore, mobile home shipments are included in the equation as an element that represents other economic indicators of housing starts.

Vacation Homes

Vacation homes, or occasional use dwellings, add to the number of housing starts but are not represented in increases in housing demand. Vacation homes could be an important variable in determining the number of homes demanded each year. Unfortunately, statistics on second homes are not as readily available as the other home-ownership information.

The most concise information regarding home-ownership rates came from an article in *American Demographics* magazine. The data for three different age groups,

[17] Ibid.

including total number of second homes (in thousands) or timeshares and the percentage of households that own such property in 1993 are displayed in Table 4.3.

Age of Household	Number of Second Homes	% Owning Second Homes
Under 35	398	1.6%
35 to 54	1,588	4.2%
55 and older	1,350	4.0%

Table 4.3: Home-Ownership Rates of Second Homes.
Source: "Home Sweet Summer Home." *American Demographics*, November 1994.

This data was then analyzed to determine if it was consistent with the USBC data from the 1993 Housing Survey. The total number of second homes according to the article is 3,336 units, while the 1993 Housing Survey tabulates the number of vacant seasonal and occasional use housing at 3,922, with an additional 75 time-sharing units, for a total of 3,997 units. While there is some variance, it is not enough to completely throw off the statistics.

Next, the data was analyzed to determine if it complied with the household information for 1993. Table 9 shows that the home-ownership rates for second homes in 1993 agrees with the previously obtained household information. Table 9 takes the number of households for each of the three age groups from Table 4 and multiplies the number of households by the home-ownership rates of vacation homes for each age group. The numbers computed for each age group are very close to the numbers given by *American Demographics*, and the total of the three age groups only varied from the article's number by 20 units. Given this analysis, these rates are assumed to be reasonable.

Because the rates given were only for 1993, these rates had to be applied to the twenty year period prior to 1993 for the analysis. Although the rates have most likely changed in that amount of time, any changes in the rates would not have significantly affected the number of housing units. Because the rates and the total numbers are so small compared to the total number of housing units, more error in the estimate is tolerated for the analysis.

Table 10 shows the results of using the article's second home-ownership rates on the number of households in each age group taken from Table 4. First, the number of households from various age groups were added together to get totals for the age groups given in second home-ownership data. Next, the number of households in each age group was multiplied by the home-ownership rate for that age group to obtain the total supply of second houses for that year. The difference in the current year's and the prior year's supply is ΔOUH, as computed in equation (6) of Chapter 3.

Because both the increase in owner-occupied housing and the increase in vacation homes are based on demographic data, it is expected that they will be highly correlated. Table 11 shows the two variables together. A correlation run on Microsoft Excel determined that the two variables are highly correlated, at 0.7131. Therefore, the number of vacation homes built each year should not be added into the regression model. Instead, this number will be subtracted from the number of housing starts each year. The independent variable is effectively the number of housing starts less the number of those starts that consist of second homes.

Housing Units Removed

Another factor that is not yet in the equation is the number of housing units removed from the housing stock each year. This is another variable that is not readily available from the Census information. However, because the census maintains information concerning the year that structures were built, the number of housing units destroyed can be estimated by looking at several different years of housing data.

It was found that the number of housing units removed each year is a very significant number. Table 12 shows the calculation, using census information from the years 1970, 1975, 1980, 1985, 1989, and 1993, showing housing units classified into the decade in which they were constructed. These data worked to show housing removals because new housing units built could not be placed into any of these categories. For example, in the period from 1980 to 1985, any reductions in the number of housing units built in the 1960's would be strictly removals from the housing market.

The total number of owner-occupied housing units removed for each age group of houses was then computed using the data. For example, between 1980 and 1985, the number of owner-occupied units constructed in the 1960's declined from 11,227 to 10,035, for a total decline of 1,192 units, or 10.62 percent. At the beginning of the 1980's, these units were between 10 and 20 years old, so the number of houses between the ages of 10 and 20 years declined by an average of (10.62/5) 2.12 percent a year for this five year time period.

Why is housing stock removed from the supply? One way that housing is removed is that owner-occupied housing is turned into renter-occupied housing as it gets

older. As neighborhoods get older, the relative values of housing in these neighborhoods tend to decline. While this may not be true in upper class neighborhoods, it would hold for middle and lower class housing. As the relative value declines, the level of income of the neighborhood's residents tends to fall. Lower income households are more likely to rent than to purchase, because of difficulties in coming up with a down payment and, perhaps, difficulty in obtaining a mortgage. Therefore, the market for renters in these lower value house neighborhoods increases as the relative value decreases.

Table 4.4 shows the percentage of housing units in 1993 that are owner-occupied based on the decade in which the housing was built.

Year Built	Total Housing Units	Percent Owner-Occupied
1990 to 1994	4,576	81%
1980 to 1989	15,140	66%
1970 to 1979	20,818	64%
1960 to 1969	14,405	66%
1950 to 1959	12,360	72%
1940 to 1949	7,539	62%
1930 to 1939	5,853	56%
1920 to 1929	5,047	56%
1919 and earlier	8,986`	58%

Table 4.4: Percentage of Housing Units Owner-occupied by Decade Constructed *Source: American Housing Survey, 1993.*

The figure shows that as housing units get older, they generally have a lesser tendency to be owner-occupied. The percentage of houses that are owner-occupied drops significantly in the first few years, and then only drops slightly over the years. Housing built in the 1950's probably has a higher percentage because are probably owned by residents who first got involved in the housing boom after World War II. These older individuals are now in their highest home-ownership rate years.

A close examination of the data in Table 12 reveals some discrepancies. The most striking problem is that the number of owner-occupied housing between some periods actually increased. For example, between 1975 and 1980 the number of owner-occupied housing units constructed in the 1950's increased. This is a result of two factors: actual increases in owner-occupied housing, and differences in weighting by the Census Bureau. First, the number of housing units might have increased over the period of time. For example, there might have been housing that was vacant in 1975 and became occupied by 1980. Houses that were condemned and abandoned in the earlier period may have been fixed up during the time covered and occupied in the current period.[18]

Another difference comes from different weighting ratios for the tested samples. The Housing Survey uses decennial information to determine the weight applied to its sample for the biannual housing survey, because the decennial census is much more complete than the biannual ones. Every ten years, then, this weighting is adjusted to match the decennial census.[19] American Housing Surveys that are closer to decennial census years should be closer to the actual number of housing units, while the years in between (1975 and 1985 in this example) would not be as accurate. While this causes fluctuations within five year time periods, the overall trend covering the 22 year period should remain relatively stable. Therefore, the average number of units for each age group covering the 22 year period is taken as the closest approximation of the number of housing units removed from the housing stock each year.

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[18] US Bureau of the Census, American Housing Survey, 1983.

The percentages of owner-occupied housing units removed from the stock is used to compute the approximate number of units removed for each of the years in Table 13. This gives the total number of units removed in the years 1970, 1975, 1980, 1985, 1989, and 1993. The years in between must be extrapolated in order to be used in the model. This is accomplished on Table 14. Table 14 assumes a linear series between the numbers; the numbers which were computed at Table 13 are displayed in bold typeface. Because these estimates are average units removed based on the age structure of the existing housing stock, a linear series is the most reasonable to use. It is not necessarily a growth series, where the current year's value is based on last year's.

Another factor affecting the number of houses removed annually from the housing stock is the number of mobile homes. It was suspected that mobile homes accounted for a large amount of removals because they do not last as long as regular houses. This suspicion was confirmed by analyzing the statistical information. Table 15 shows the number of mobile home units in the housing stock at 1980, 1985, 1989, and 1993. The increases in the total numbers for each of these time periods indicate the total net increases in mobile home units. Below the net increase is the total number of mobile home shipments covering the four or five year time period, taken from Current Construction Reports Series C20. The differences in these two numbers show the total removals of mobile homes from the market. The computations denote that an average of 93,400 mobile home units have been removed from the housing stock annually from 1980 to 1993. Mobile homes, while currently accounting for roughly 7 percent of

[19] US Bureau of the Census, American Housing Survey, 1991.

occupied housing units, account for between one fourth and one fifth of housing unit disposals.

Table 16 shows all the independent variables computed. The estimated increase in homeowner households is taken from Table 11, the number of mobile homes shipments is taken from Table 8, and the annual number of housing units removed from Table 14. Also, housing starts are copied from Table 7, and the estimated number of vacation houses demanded each year is taken from Table 11. The dependent variable is housing starts less the estimated demand for vacation homes, and the three independent variables are the increase in homeowner households, shipments of mobile homes, and the annual number of housing units removed.

A regression was run on Microsoft Excel using housing starts less vacation homes as the Y variable, and the three independent determinants as the X variable. The resulting equation is:

$$Y = -685{,}717 + 0.268X_1 + 2.249X_2 + 3.187X_3$$

Where

Y = Housing starts less vacation homes started

X_1 = Number of new, home-owner households

X_2 = Number of owner-occupied housing units removed during the year

X_3 = Number of mobile home shipments.

The statistical results are displayed in Table 17, with a summaries in Tables 4.5 and 4.6.

Regression Statistics	
Multiple R	0.755555539
R Square	0.570864172
Adjusted R Square	0.490401204
Standard Error	131512.1048
Observations	20

Table 4.5: Regression Statistics for Housing Starts to Housing Demand Determinants
Source: Table 17, Appendix.

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-685716.5	597864.8	-1.14694	0.26827
Demographic Demand	0.26779	0.08463	3.16445	0.00601
Housing Removed	2.23874	1.28867	1.73726	0.10155
Mobile Home Shipments	3.18658	1.08661	2.93259	0.00976

Table 4.6: Regression Statistics for Housing Starts to Housing Demand Determinants
Source: Table 17, Appendix

The regression has a correlation of 0.76, and an r-squared of 0.57. As expected, the variable of demographic demand has the highest t-statistic of the variables, at 3.16. This variable is ΔOOHU, or the increase in the number of households that own their own homes. The coefficient reflects that this variable only accounts for a portion of the number of housing starts, though.

The number of mobile homes shipped has the next highest t-statistic, and has a coefficient of 3.19. This reflects that the number of mobile home shipments is determined by most of the same economic data that housing starts are. When interest rates fall, they fall for both mobile homes and houses, making each easier to purchase. Similarly, if rental rates increase, individuals would be more inclined to purchase both

houses and mobile homes, because the relative price of rental property has increased. As such, the number of mobile homes produced can be extrapolated to serve as a variable indicating the number of housing starts.

Finally, the number of housing units removed from the owner-occupied housing stock is relevant with a t-statistic of 1.74. The coefficient of 2.24 also indicates that this number is picking up other economic data in the model. Because this is not a coefficient of one, housing units destroyed must also take into account other economic data. When the country is in sound economic condition, for example, more people may have money at their disposal to invest in rental units, effectively removing owner-occupied housing. While owner-occupied housing decreases by such an action, the quality of strong economic condition spurs additional housing starts, apparently more than enough to make up for the loss.

Another factor that would cause a coefficient greater than one for housing units destroyed is development of rural land. As the economy get better, developers purchase farm land on which to develop neighborhoods. Thus, one housing unit is destroyed to make way for an additional amount to be constructed, which are all new housing starts. In this regard, this can be looked at as a measure of optimism that developers are feeling toward the housing economy. A developer buying rural land is most likely optimistic that the housing market is going to remain stable for the amount of time it takes to develop the land, which can run into years.

Given the r-squared of 0.57, there are apparently other determinants that go into establishing the number of housing starts each year, and this was certainly to be expected.

Factors such as real income and interest rates influence the actual number of starts, as do national economic figures such as GDP. Other variables which are not as easily measured would also affect yearly housing starts. For example, the general level of optimism or pessimism regarding the future of the economy would impact yearly starts. Also, political uncertainty would probably affect the number. However, considering that this model only really is examining the general demographics of the housing environment, an r-squared of .57 is considered adequate to continue in predicting the housing starts of the next decade. It is also noted that this correlation is only testing 20 years of data; additional observations may also help to increase the significance of the equation, and would certainly enhance the explanatory powers of the model.

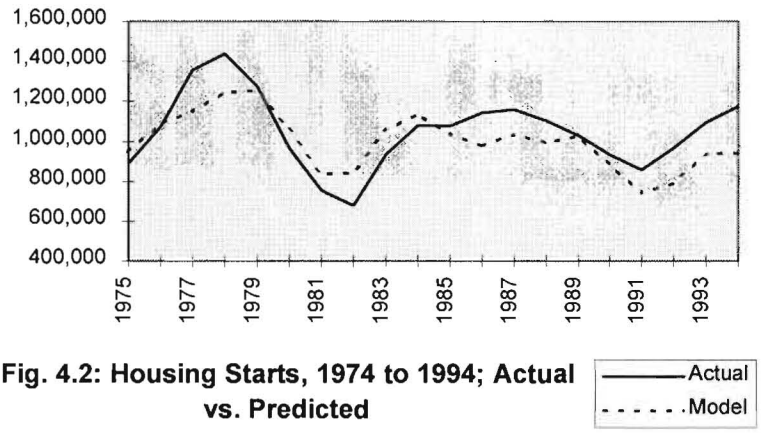

Fig. 4.2: Housing Starts, 1974 to 1994; Actual vs. Predicted

Figure 4.2 charts the actual number of housing starts from the years 1974 to 1995 against the predicted number of housing starts, using the equation from the model. As the chart shows, the model does provide a relatively accurate estimate of the annual number of housing starts. The model does not recognize the annual fluctuations that the number

of housing starts experiences, but does provide a reasonable assessment of the average number of units produced over time.

Part Two: Demand Predictions

Household Information

Household information for the next ten years is predicted by the USBC. Their projections, from Series 1 of the data, are included in Table 18 of the Appendix. The data only gave 5 year increments up to the age of 34, and then gave the number of households using 10 year increments. As such, a projection of total population was obtained from the USBC that gave population in 5 year increments for the entire population. This projection is displayed in Table 19. The proportions of residents in each 5 year age group was assumed to be the proportions of householders in that age group, and the number of households in each age group was adjusted accordingly. This is the same computation that was performed on the household information in Table 3.

Table 20 shows the projected household population for the years 1995 to 2005, modified into 5-year age groups. Fortunately, the data provided by the Census Bureau shows the number of households every year, so no series computations are necessary as in the previous household data.

Home-ownership Rates

The next step in projecting future demand for housing is predicting the household home-ownership rate information. Table 5 displays home-ownership rates by age group from 1974 to 1995, provided by the USBC. Home-ownership rates are affected by many

different determinants, including real income, interest rates, GDP, and other economic indicators. Despite these determinants, which can vary considerably from year to year, it is noted that home-ownership rates remain relatively stable. Apparently, the desire for homes remains relatively constant over time, even as economic and other determinants fluctuate.

The first prediction of home-ownership rates uses a naïve forecasting model based on the rates from 1995. The 1995 home-ownership rates for each age group are assumed to remain the same for the period from 1996 to 2005. Any variations in the number of houses demanded, then, arise solely from changes in the demography. Table 21 shows the home-ownership rates for each age group from 1995 to 2005 assuming the same rates as 1995. Table 22 computes the OOHU and ΔOOHU for each year from 1995 to 2005 using constant rates and household projections from the USBC.

Housing Units Removed

The next step is to estimate the number of households that will be removed during the time period from 1995 to 2005. This variable will be relatively easy to determine because it is a function of the age structure of the existing housing stock. Using information from the Housing Survey from 1993, the general age characteristics of the housing stock for the next ten years are already generally known.

The determination of the annual number of housing units removed from the housing stock is exhibited in Table 23. Using data from the 1993 American Housing Survey, the number of housing units in each age group of housing was determined for

1995. The appropriate percentage rates were multiplied by the number of units to obtain the estimated number of owner-occupied housing removed from the housing stock for each of the five years after 1995. These units were then removed from the total number of houses.

Next, the age structure of housing units was determined for the year 2000 by subtracting the units removed and shifting all the units down by five years. The number of housing units removed per year in the five years after the year 2000 was determined, and the process was carried out again for the year 2005. Thus, the average number of units removed from the housing stock was estimated for the years 1995, 2000, and 2005. After moving these numbers to Table 24, the years in between were filled in assuming a linear series, similar to the method described earlier for the historical data.

Mobile Home Shipments

For the first set of predictions, the number of mobile home shipments will be assumed to remain constant at 1994 levels. In 1994, the mobile home industry shipped 286,000 units. Therefore, it is assumed that this is the number of shipments every year for the period from 1995 to 2005.

Vacation Homes

Given the number of households based on age groups, the number of vacation homes can be predicted in a manner similar to the overall demand in total housing units. This is accomplished by using the demographic data in Table 25. Table 25 assumes a constant home-ownership rate of vacation homes, as discussed earlier in the chapter.

Taking this constant value times the number of households in each age group over the time series gives the estimated number of vacation houses demanded each year. The increase from one year to the next indicates the demand for new vacation houses that must be satisfied.

Table 26 puts these all of these determinants together and computes the equation for the dependent variable as displayed in Table 17. The number of vacation houses constructed are then added to the dependent variable to estimate total housing starts for each year. The resulting housing starts are exhibited in Table 26 and graphed on Figure 4.3, along with actual housing starts from 1974 to 1994 and a trendline covering the entire period.

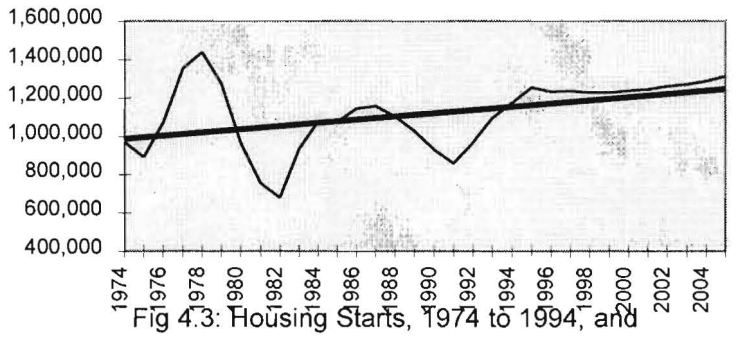

Fig 4.3: Housing Starts, 1974 to 1994, and Projected, 1995 to 2005 *Source: Table 26, Appendix*

The chart shows housing starts dropping a slightly until about 1999, then rising up slowly from there. Housing starts into the next decade follow very closely with the trendline generated from the past annual data. Looking at Table 26 explains the dip and recovery. Homeowner household formation declines considerably at first, but then the decline is less noticeable. Also, the number of houses removed from the housing stock

rises each year, increasing the number of replacement houses required. This is because, even without significant increases in the demographics of households, the existing housing stock is still growing, and the age structure is getting older. Thus, even with a lower household demand variable, the number of houses that require replacement will still increase.

Figure 4.3 shows that demographics themselves do not indicate a major decrease in the demand for housing in the future based on demographics, as Mankiw and Weil predicted. The only variable that changes to affect housing starts for Figure 4.3 is the number of homeowner households by age group. Although this does affect the demand for housing, the decline in households is made up in other areas, such as in housing units that are removed from the housing stock. Despite shifts in the age structure of the household population, Figure 4.3 shows housing starts remaining relatively stable during the next decade.

Changes in Demography

The primary value that will change across age groups in the demography is the home-ownership rates. The projection of the number of households is set by the Census Bureau and the number of housing units removed each year is a function of the age structure of the existing housing. However, the determinant that can change the most in the equation is the home-ownership rates. Specifically, the effects of the baby boomers on home-ownership rates will be determined. The baby boomer generation is defined as those individuals who were born between the years of 1946 and 1964.[20]

[20] Michael Sivy, "Cashing in on the Middle-Aging of America," *Money*, December 1995, p. 100.

Table 27 displays household projections from the Census Bureau from Table 20. Table 28 shows the historical home-ownership rates from the National Association of Home Builders, with the baby boomers highlighted. In the past, the trend of the baby boomers has been relatively consistent. When the boomers enter the each age group, the home-ownership rates within that age group tend to decrease. This is expected, because of the large number of people within the baby boom. The absolute number of housing units may actually increase, while the percentage home-ownership rate declines.

Table 29 exhibits the effects of the baby boomers entering the different age groups on home-ownership rates. Although there are mild fluctuations prior to the entrance of the boomers, there are much more noticeable declines once the boomers enter the age groups. These changes represent percentage changes in the home-ownership rates for age groups based on the number of years the boomers have been in the market. These fluctuations are entered into the home-ownership rates for future periods on Table 28, using the average fluctuations exhibited in Table 29. The changes in the home-ownership rates of the baby boomers were averaged for the fist 22 years that the boomers were in the market. The number of years that boomers were in the market is longer than the actual number of years of the baby boom (18) because the data inserts the boomers into five-year age groups. Thus, the boomers are in the market in the first few years of Table 29 with individuals who are not a part of the baby boom. The period after the boomers leave the age groups and before the boomers enter the age groups are assumed to remain constant for this scenario.

The effects of the baby boomers as it relates to housing are surprising. The boomers actually lower the home-ownership rate consistently as they becomes members of an age group. Using historical information about the ownership rates of the baby boom has the effect of lowering the determinant of demand for housing, ΔOOHU. It was expected that the baby boomers, with their "conspicuous consumption," would have increased the demand for housing, with a higher percentage demanding housing. However, the boomers have actually consumed housing at a lower rate than the older generation. The demand variable ΔOOHU is computed at Table 30.

Table 31 plugs the changing home-ownership rate data into the original equation, and Figure 4.4 charts housing starts according to the ownership projections from 1995 to 2005, along with actual housing starts from 1974 to 1994.

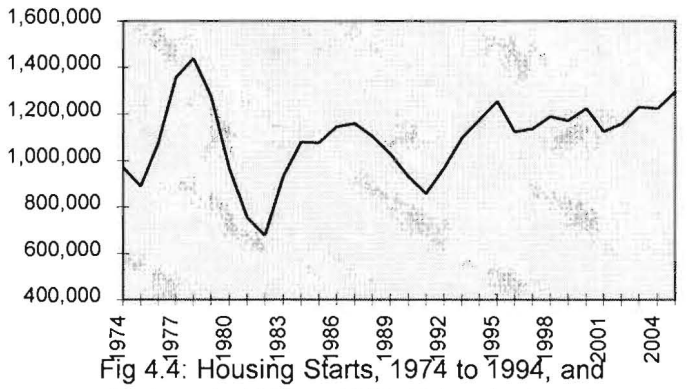

Fig 4.4: Housing Starts, 1974 to 1994, and Projected, 1995 to 2005, Using Projected Ownership Rates *Source: Table 31*

This projection should give builders more reason to be concerned than the previous projection, which assumed constant home-ownership rates. Housing starts are more volatile, and the general trend shows more of a downward trend until about 2002. Apparently, any changes in the home-ownership rate, even among just one set of people,

have a noticeable effect on the housing starts. Assuming the baby boomers maintain their historical trend of lowering the home-ownership rates when they enter age groups, the building industry will face somewhat decreased and more volatile demand over the next ten years.

Another scenario will look at the possibility of an increase in the housing consumption of the baby boomers. Despite historical trends, this is certainly a possibility. Baby boomers are known to have waited longer than the older generation before settling down. Also, demographers are predicting that many baby boomers who could not afford to purchase owner-occupied housing earlier will soon have the financial resources to purchase a home.[21] The next analysis will assume that baby boomers are somewhat "late bloomers," and that once the generation starts to enter their fifties, the number of them purchasing housing will also increase.

Once an individual turns fifty, they are at their peak earning years, and their children start to move out of the house. This leaves families with a substantially increased amount of disposable income. Therefore, it is reasonable to assume that the baby boomers will tend to demand more housing as they surpass the fifty year mark.

The average reduction in home-ownership rates for each age group within the boomers has been 0.86 percent annually. This model assumes that once baby boomers enter their fifties, this decline will reverse itself, and the home-ownership rates for each age group will start to increase at the same rate. Over the course of time, then, the home-ownership rates will assume their pre-boomer average levels. Because the first baby

boomers were born in 1946, the first boomers will start to turn fifty at the beginning of the projection time period.

The results of the adjusted home-ownership rate data are shown in Table 32, with the new values carried through in Table 33. The results of the housing start equation are shown in Table 34, with the number of housing starts charted in Figure 4.5.

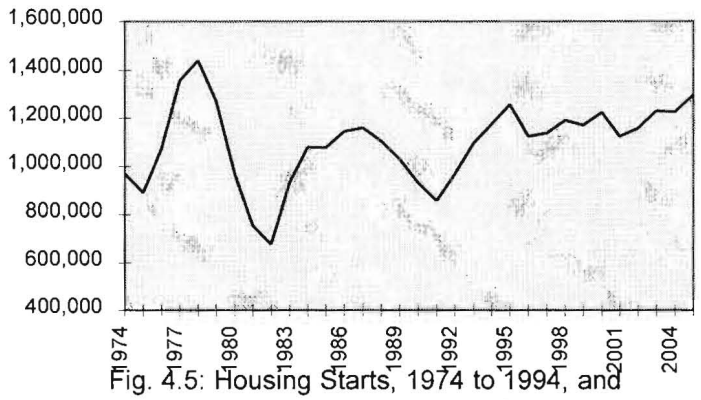

Fig. 4.5: Housing Starts, 1974 to 1994, and Projected, 1995 to 2005, Using Projected Ownership Rates *Source: Table 34*

Figure 4.5 shows that the number of housing starts is not very different from Figure 4.4. The general trends and relative volatility are about the same, except that this chart is a little more optimistic about the future towards the year 2005. The small level of difference is most likely due to the fact that only a few of the variables were changed in the equation. Because the boomers are just turning 50 now, by the year 2005 only about the first 10 years of boomers will have turned fifty. The oldest will just be turning 60, so only one decade of baby boomers will have experienced substantial housing growth. This amount is not enough to significantly affect the number of housing starts in the next decade.

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[21] James T. Hughes and Todd Zimmerman, "The Dream is Alive," *American Demographics*, August 1993,

Changes in Mobile Home Shipments

Finally, these equations will be changed to assume that the number of mobile home shipments is going to change, following the trend of past production. The TREND command from Microsoft Excel was used to predict mobile home shipments for the next decade. The TREND command assumes a linear trend from the data points, and predicts future variables along this linear trend.

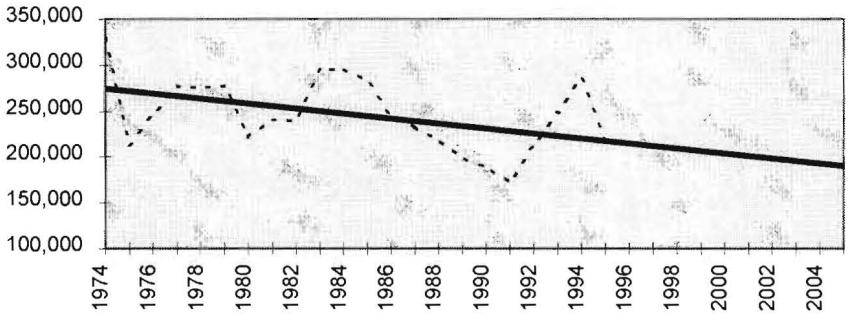


Fig 4.6: Mobile Home Shipments, Actual 1974 to 1994, predicted Assuming a Linear Trend, 1995 to 2005 *Source: Table 35*

Figure 4.6 graphs how the Trend prediction works. The actual mobile home shipments are graphed along the dotted line, and the dark line represents a linear trend based on the least squares fit along the line. The trend continues into the next decade to predict mobile home shipments for that time period. The predicted number of mobile home shipments for each year is displayed in Table 35.

p. 35.

Table 36 inserts the changing values for mobile home production into the first

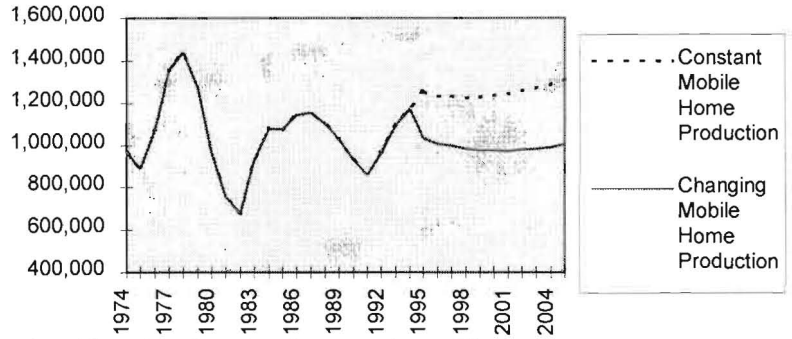


Fig 4.7: Housing Starts, Constant vs. Changing Mobile Home Production ***Source: Table 26 and Table 36***

estimate of housing starts, which assumed constant home-ownership rates within age groups. Figure 4.7 charts the new estimate of housing starts against the previous estimate of housing starts which assumed constant mobile home production.

The decline in mobile home production causes a noticeable decline in the number of housing starts. Housing starts fall significantly in the first few years, only to inch up after the year 2000. Housing starts never get back up to the 1995 level. This prediction is much less optimistic about the next decade of the housing industry; it shows an overall downward trend in the number of housing units started. However, even with this downward trend, the average number of units started does not decrease significantly from the historical number of starts. Also, it is noted that the number of starts evens out, and eventually rises again. This is apparently not the start of a major fundamental downturn in housing starts.

Chapter 5 - Summary and Conclusions

The Mankiw-Weil model for estimating housing demand is not a reliable predictor of the demand for housing. The equation set out in Chapter 3 takes into account most of the demographic data that could be used to estimate the number of houses that would be constructed each year. However, demographics by themselves only tell part of the story. Other economic factors need to be introduced into the model in order for the model to be significant.

There are several conclusions that can be drawn from the research. First, no predictions indicate a significant decline in the number of housing starts. Even the scenario that showed a downward trend edged up again after the year 2000. Furthermore, the decline in demand was not nearly as noticeable as the decline that Mankiw and Weil predicted by the year 2005. The demographics do not indicate a large decline in the demand for housing, as Mankiw and Weil predicted.

Detailed analysis of the predictions reveal other insights to the housing industry. For example, the demographic data at Table B9 can be examined to indicate changes in the demographics of the demand for housing.

Age	1995	2005	% Change
< 25	767,401	858,382	11.9%
25-29	2,736,286	2,597,483	-5.1%
30-34	5,750,073	4,776,758	-16.9%
35-39	7,405,838	6,552,511	-11.5%
40-44	7,429,950	8,237,852	10.9%
45-49	7,333,114	9,342,071	27.4%
50-54	5,985,208	8,660,791	44.7%
55-59	5,097,462	7,759,819	52.2%
60-64	4,707,121	6,008,956	27.7%
65-74	9,592,165	9,388,082	-2.1%
75 & up	6,948,439	8,424,393	21.2%

Table 5.1: Estimated Housing Demanded by Age Group, 1995 and 2005
Source: Table B9, Appendix B

Table 5.1 shows the estimated number of housing units demanded for each age group at 1995 and 2005 from Table B9 (assuming constant home-ownership rates among age groups). The data indicate that the housing demanded by younger households is going to decline significantly, while almost all of the growth in housing will come from the baby boomers. The age group of households 50 to 59 is expected to experience growth of about 45 percent and 52 percent for each age group. This has serious implications for anyone in the housing industry. The successful builder will evaluate the needs of the aging baby boomer population, and will build a product that will satisfy this group of buyers.

Of course, deciding what the baby boomers are going to want in a house and fulfilling that need is not necessarily easy, and not within the scope of this study. In taking this research further, one might examine the qualities that have become popular in new houses as the baby boomers have aged, and determine how this will affect the characteristics of new housing in the future. Also, simply looking at family units and how they are changing makes it easier to predict what the buying public will want.

Because a large portion of the increased demand in housing will probably come from those over fifty, houses may get smaller over time. Boomers looking forward to retirement may desire a smaller house, with a smaller lawn and less upkeep. Analysts predict that low-end, primary homes will appreciate the least in the future.[1] The data in

[1] Lesley Alderman, "What's Ahead for Real Estate," *Money Magazine*, December 1995, p. 107.

Table 5.1 support this finding with the decrease in total units demanded over the next ten years.

The demand of housing for households under the age of 25 also gives an indication of trends in the future. As the boomers enter their late 50's, their children are starting to enter the age at which they begin to demand housing. An increase of 11 percent in the housing demanded by those under the age of 25 probably indicates that this group of individuals will also effect the housing industry. Residential construction companies will probably want to closely watch the numbers of these households and be ready to take advantage of any significant increases in their home-purchasing power.

Another limitation with this research is that it uses all national housing statistics. Taking the number of housing starts for the entire nation has a noticeable averaging effect on the statistic. The country might experience one million housing starts in 1996, but these starts might be heavily concentrated in the southern states as individuals migrate there.

One could potentially regionalize the demographic data to attempt to determine where the greatest demands for new housing are going to be. This would indicate fluctuations between regions and tell which regions are predicted to experience the most growth in housing over the next decade. In terms of the housing industry, fluctuations among regions would favor the large builders. Most large builders have operations in several regions, and are diversified enough to handle a decline in any one region. However, the smaller builders in declining regions have less hope of success.

Vacation homes produce an issue which was small in terms of total numbers produced, but could be very important to certain regions or the vacation home builders in general. While the total number of vacation homes is small, the areas in which vacation homes are built is probably also much smaller than the number of areas in the country. Thus, a decline in the number of vacation homes built might be small, but any fluctuation would probably have a noticeable effect on the markets in which these units are constructed.

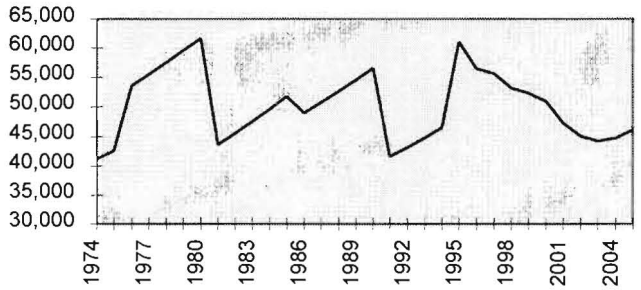


Fig 5.1: Estimated Demand for Vacation Homes, 1974 to 2005 ***Source: Table A11***

Figure 5.1 charts the estimated number of additional vacation homes demanded each year from 1974 to 2005. This figure indicates a large increase at first, with a tapering off after about 1996. However, this held the home-ownership rates for vacation homes constant across age groups. One might argue that the baby boomers will demand more second housing than their predecessors did, as they are much more consumer-oriented. In fact, articles have been speculating that the vacation home market is currently a lucrative market due to the potential of the baby boomers. Baby boomers, because of their sheer numbers, tend to drive up the price of items in markets that they

enter.[2] In fact, the entire Mankiw-Weil model was based on speculation that the baby boomer's entering of the housing market caused the sharp appreciation of housing value experienced during that time. Although this research does not necessarily show a large increase in demand, it is very probable given the nature of the baby boomers, and a vacation house would probably be a solid investment.

This model does not give an indication of the value of housing investment. While housing units may remain stagnant or even decline, the value of housing demanded may actually increase, and residential construction companies can make more money building fewer homes. Alternatively, the boomers may start to decide that they need smaller houses, and want to put their money into other recreational activities, demanding less expensive homes. This might have more serious repercussions on the housing industry.

Finally, no model can predict what the government is going to do with taxes. With the baby boomers soon turning 50, the government may decide that the potential revenues of boomers selling their homes is too much to give up. The gain that citizens over the age of 55 are able to deduct from the sale of their primary residence may be in jeopardy. The government could also decrease or eliminate the residential mortgage deduction, which would effectively devalue all of the residential-owned properties in the country. New families thinking about purchasing a home would probably have to wait longer before making the purchase, and the overall demand would most likely decrease.

Despite these limitations with the data, the study was successful in showing that the country will not experience a significant decline in the demand for housing as the

[2] Maggie Mahar, "Eden for Sale," *Barron's*, July 1, 1995, p. 24.

baby boomers age. The boomers will still demand housing, and may demand housing increasingly as they age. Also, even if the demographics do not indicate increased demand, there will still be demand from other variables, such as housing units removed from the market. Overall, the housing market should remain relatively strong into the next decade, and the home building industry should fare well as they enter the next millennium.

Appendix

Table 1

Households, by Age of Householder: 1970 to 1994

	Households, in thousands					
Age of Householder	**1970**	**1975**	**1980**	**1985**	**1990**	**1994**
Total	*63,400*	*71,100*	*80,800*	*86,800*	*93,300*	97,100
Age of Householder						
15 to 24 years old	4,400	5,800	6,600	5,400	5,100	5,300
25 to 29 years old	6,100	7,800	9,300	9,600	9,400	8,500
30 to 34 years old	5,600	7,100	9,300	10,400	11,000	11,200
35 to 44 years old	11,800	11,900	14,000	17,500	20,600	22,300
45 to 54 years old	12,200	12,900	12,700	12,600	14,500	16,800
55 to 64 years old	10,800	11,300	12,500	13,100	12,500	12,200
65 to 74 years old	7,700	8,900	10,100	10,900	11,700	11,600
75 and over	4,800	5,400	6,400	7,300	8,400	9,200

Source: Table No. 68, Statistical Abstract of the United States, 1995.

Table 2

Resident Population, by Age: 1970 to 1994

Age	Population, in thousands 1970	1975	1980	1985	1990	1994
Total	**203,235**	**214,891**	**226,546**	**237,924**	**248,718**	**260,341**
Under 5	17,163	16,756	16,348	17,842	18,757	19,727
5-9	19,969	18,335	16,700	16,665	18,035	18,859
10-14	20,804	19,523	18,242	17,027	17,060	18,753
15-19	19,084	20,126	21,168	18,727	17,886	17,616
20-24	16,383	18,851	21,319	21,265	19,135	18,326
25-29	13,486	16,504	19,521	21,671	21,328	19,177
30-34	11,437	14,499	17,561	20,025	21,833	22,177
35-39	11,113	12,539	13,965	17,604	19,846	21,961
40-44	11,988	11,829	11,669	14,087	17,589	19,699
45-49	12,124	11,607	11,090	11,606	13,744	16,679
50-54	11,111	11,411	11,710	10,854	11,313	13,191
55-59	9,979	10,797	11,615	11,229	10,487	10,936
60-64	8,623	9,356	10,088	10,906	10,625	10,082
65-74	12,443	14,012	15,581	16,858	18,046	18,712
75-84	6,122	6,926	7,729	8,890	10,012	10,925
85 and up	1,408	1,824	2,240	2,667	3,022	3,522

Source: Table No. 14, Statistical Abstract of the United States, 1995.

Table 3

Households, by Age of Householder: 1970 to 1994 (Revised)

	Households, in thousands					
Age of Householder	**1970**	**1975**	**1980**	**1985**	**1990**	**1994**
Total	*63,400*	*71,100*	*80,800*	*86,800*	*93,300*	97,100
Age of Householder						
15 to 24 years old	4,400	5,800	6,600	5,400	5,100	5,300
25 to 29 years old	6,100	7,800	9,300	9,600	9,400	8,500
30 to 34 years old	5,600	7,100	9,300	10,400	11,000	11,200
35 to 39 years old	5,677	6,123	7,627	9,721	10,921	11,755
40 to 44 years old	6,123	5,777	6,373	7,779	9,679	10,545
45 to 49 years old	6,366	6,505	6,177	6,511	7,953	9,381
50 to 54 years old	5,834	6,395	6,523	6,089	6,547	7,419
55 to 59 years old	5,794	6,054	6,690	6,646	6,209	6,348
60 to 64 years old	5,006	5,246	5,810	6,454	6,291	5,852
65 to 74 years old	7,700	8,900	10,100	10,900	11,700	11,600
75 and over	4,800	5,400	6,400	7,300	8,400	9,200

Source: Revised from Table No. 68, Statistical Abstract of the United States, 1995.

Table 4

Households, by Age of Householder: 1970 to 1994 (Revised)

Households, in thousands

Age of Householder	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Total	*63,400*	*64,870*	*66,375*	*67,914*	*69,489*	*71,100*	*72,942*	*74,832*	*76,771*	*78,760*	*80,800*	*81,966*	*83,149*	*84,348*
Age of Householder														
15 to 24 years old	4,400	4,650	4,914	5,193	5,488	5,800	5,952	6,108	6,268	6,432	6,600	6,340	6,091	5,851
25 to 29 years old	6,100	6,407	6,730	7,069	7,426	7,800	8,079	8,369	8,668	8,979	9,300	9,359	9,419	9,479
30 to 34 years old	5,600	5,872	6,158	6,457	6,771	7,100	7,494	7,909	8,348	8,811	9,300	9,510	9,725	9,945
35 to 39 years old	5,677	5,763	5,851	5,941	6,031	6,123	6,398	6,686	6,986	7,299	7,627	8,006	8,404	8,822
40 to 44 years old	6,123	6,052	5,982	5,913	5,844	5,777	5,891	6,008	6,127	6,249	6,373	6,632	6,902	7,183
45 to 49 years old	6,366	6,394	6,421	6,449	6,477	6,505	6,438	6,372	6,306	6,242	6,177	6,243	6,309	6,375
50 to 54 years old	5,834	5,942	6,052	6,164	6,279	6,395	6,420	6,446	6,471	6,497	6,523	6,434	6,346	6,259
55 to 59 years old	5,794	5,845	5,896	5,949	6,001	6,054	6,176	6,301	6,428	6,557	6,690	6,681	6,672	6,663
60 to 64 years old	5,006	5,053	5,101	5,149	5,197	5,246	5,354	5,465	5,578	5,693	5,810	5,934	6,060	6,189
65 to 74 years old	7,700	7,926	8,159	8,399	8,646	8,900	9,128	9,362	9,602	9,848	10,100	10,255	10,413	10,573
75 and over	4,800	4,914	5,032	5,151	5,274	5,400	5,587	5,780	5,980	6,186	6,400	6,571	6,746	6,926

Source: Revised from Table No. 68, Statistical Abstract of the United States, 1995.

Table 4

Age of Householder	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**
Total	*85,565*	*86,800*	*88,063*	*89,344*	*90,644*	*91,962*	*93,300*	*94,236*	*95,181*	*96,136*	#####
Age of Householder											
15 to 24 years old	5,621	5,400	5,339	5,278	5,218	5,159	5,100	5,149	5,199	5,249	5,300
25 to 29 years old	9,539	9,600	9,560	9,519	9,479	9,440	9,400	9,166	8,939	8,717	8,500
30 to 34 years old	10,170	10,400	10,517	10,636	10,756	10,877	11,000	11,050	11,100	11,150	11,200
35 to 39 years old	9,261	9,721	9,950	10,184	10,424	10,670	10,921	11,124	11,331	11,541	11,755
40 to 44 years old	7,475	7,779	8,126	8,490	8,869	9,265	9,679	9,888	10,103	10,321	10,545
45 to 49 years old	6,443	6,511	6,777	7,054	7,342	7,641	7,953	8,288	8,638	9,002	9,381
50 to 54 years old	6,173	6,089	6,178	6,268	6,360	6,452	6,547	6,755	6,969	7,191	7,419
55 to 59 years old	6,654	6,646	6,556	6,467	6,380	6,294	6,209	6,244	6,278	6,313	6,348
60 to 64 years old	6,320	6,454	6,421	6,388	6,356	6,323	6,291	6,178	6,068	5,959	5,852
65 to 74 years old	10,735	10,900	11,055	11,213	11,373	11,535	11,700	11,675	11,650	11,625	11,600
75 and over	7,110	7,300	7,508	7,722	7,941	8,167	8,400	8,593	8,791	8,993	9,200

Table 5

National Homeownership Rates by Age

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
National	*64.6*	*64.6*	*64.7*	*64.8*	*65.0*	*65.2*	*65.6*	*65.3*	*64.7*	*64.7*	*64.4*
< 25	19.3	19.3	19.3	19.3	19.4	19.4	19.6	19.5	19.3	18.8	17.9
25-29	42.9	43.1	43.2	42.6	43.9	44.0	43.3	41.3	38.6	38.3	38.6
30-34	61.7	62.2	62.4	62.3	62.6	61.7	61.1	58.8	57.1	55.4	54.8
35-39	69.6	69.0	68.9	69.1	69.8	70.4	70.9	68.8	67.6	66.5	66.1
40-44	73.5	73.9	74.0	73.8	74.5	74.9	74.2	73.6	73.0	72.8	72.3
45-49	76.5	77.1	77.1	76.8	77.0	76.9	76.8	76.1	76.0	75.3	74.6
50-54	76.3	77.2	77.7	78.5	77.6	78.3	78.5	78.0	78.8	78.8	78.4
55-59	77.3	77.7	78.0	76.9	77.9	78.6	79.6	79.7	80.0	80.1	80.1
60-64	75.2	76.3	76.2	77.4	77.7	77.8	78.8	79.7	80.1	79.8	79.9
65-69	73.1	73.6	73.6	74.0	74.7	75.8	77.3	77.5	77.9	78.1	79.3
70-74	69.7	69.4	71.5	71.1	71.0	72.5	72.7	75.2	75.2	75.4	75.5
75 & up	66.8	67.3	67.2	67.2	67.9	67.4	67.8	70.0	71.0	71.9	71.5

Source: National Association of Home Builders Home Page: http://www.nahb.com/ownship.html

Table 5

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
National	*63.9*	*63.8*	*64.0*	*63.8*	*63.9*	*63.9*	*64.1*	*64.1*	*64.0*	*64.0*	*64.8*
< 25	17.2	17.2	16.0	15.8	16.6	15.7	15.3	14.9	14.8	14.9	15.9
25-29	37.7	36.7	36.4	35.9	35.3	35.2	33.8	33.6	33.6	34.1	34.4
30-34	54.0	53.6	53.5	53.2	53.2	51.8	51.2	50.5	50.8	50.6	53.1
35-39	65.4	64.8	64.1	63.6	63.4	63.0	62.2	61.4	61.8	61.2	62.1
40-44	71.4	70.5	70.8	70.7	70.2	69.8	69.5	69.1	68.6	68.2	68.6
45-49	74.3	74.1	74.6	74.4	74.1	73.9	73.7	74.2	73.7	73.8	73.7
50-54	77.5	78.1	77.8	77.1	77.2	76.8	76.1	76.2	77.2	76.8	77.0
55-59	79.2	80.0	80.0	79.3	79.1	78.8	79.5	79.3	78.9	78.4	78.8
60-64	79.9	79.8	80.4	79.8	80.1	79.8	80.5	81.2	80.9	80.1	80.3
65-69	79.5	79.4	79.5	80.0	80.0	80.0	81.4	80.8	80.7	80.6	81.0
70-74	76.8	77.2	77.7	77.7	77.8	78.4	78.8	79.0	79.9	80.1	80.9
75 & up	69.8	70.0	70.8	70.8	71.2	72.3	73.1	73.3	73.3	73.5	73.5

Table 6

National Owner-occupied Housing Units by Age

Age	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
< 25	1,057,593	1,117,670	1,148,705	1,180,599	1,215,245	1,250,896	1,291,519	1,235,037	1,175,550	1,100,048	1,006,183
25-29	3,185,656	3,361,800	3,490,246	3,565,000	3,805,328	3,950,554	4,026,900	3,865,366	3,635,679	3,630,402	3,682,145
30-34	4,177,625	4,416,200	4,676,144	4,927,609	5,225,976	5,436,548	5,682,300	5,592,041	5,553,148	5,509,637	5,573,190
35-39	4,197,830	4,225,207	4,408,480	4,619,749	4,876,032	5,138,715	5,407,529	5,508,244	5,681,247	5,866,658	6,121,287
40-44	4,295,557	4,268,842	4,359,466	4,433,981	4,564,884	4,680,489	4,728,781	4,881,330	5,038,465	5,229,039	5,404,355
45-49	4,954,904	5,015,404	4,963,816	4,893,643	4,855,921	4,799,732	4,744,185	4,750,657	4,794,587	4,800,662	4,806,330
50-54	4,790,574	4,936,891	4,988,560	5,059,897	5,021,711	5,087,092	5,120,300	5,018,170	5,000,367	4,932,043	4,839,959
55-59	4,638,866	4,704,068	4,817,465	4,845,311	5,007,307	5,154,192	5,325,036	5,324,667	5,337,634	5,337,231	5,330,165
60-64	3,908,189	4,002,590	4,079,879	4,229,694	4,333,760	4,428,933	4,578,482	4,729,182	4,853,920	4,938,504	5,049,771
65-74	6,320,152	6,550,400	6,718,218	6,927,783	7,172,481	7,464,562	7,807,300	7,947,748	8,111,495	8,257,251	8,512,922
75 & up	3,676,174	3,747,600	3,994,451	4,109,395	4,245,451	4,484,982	4,652,800	4,941,131	5,072,884	5,222,002	5,368,355
Total	45,203,121	46,346,672	47,645,429	48,792,663	50,324,095	51,876,695	53,365,132	53,793,574	54,254,976	54,823,477	55,694,662
Increase		1,143,551	1,298,757	1,147,234	1,531,432	1,552,600	1,488,437	428,442	461,402	568,500	871,185

Source: Table 4 multiplied by Table 5

Table 6

Age	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
< 25	928,800	918,243	844,470	824,436	856,334	800,700	787,840	774,657	776,893	789,700
25-29	3,619,200	3,508,396	3,465,096	3,403,139	3,332,201	3,308,800	3,098,256	3,003,396	2,928,771	2,898,500
30-34	5,616,000	5,637,285	5,690,244	5,722,168	5,786,720	5,698,000	5,657,427	5,605,273	5,664,028	5,667,200
35-39	6,357,571	6,447,602	6,528,164	6,629,792	6,764,596	6,880,229	6,919,052	6,956,942	7,132,345	7,194,310
40-44	5,554,166	5,729,170	6,010,600	6,270,266	6,504,077	6,755,943	6,872,506	6,980,848	7,080,339	7,191,412
45-49	4,837,625	5,021,614	5,261,937	5,462,124	5,662,243	5,877,552	6,108,612	6,409,173	6,634,200	6,923,097
50-54	4,719,025	4,824,973	4,876,595	4,903,257	4,981,278	5,027,799	5,140,261	5,310,547	5,551,180	5,697,876
55-59	5,263,299	5,244,724	5,173,953	5,059,475	4,978,615	4,892,807	4,963,612	4,978,547	4,980,870	4,976,718
60-64	5,157,082	5,124,254	5,136,346	5,071,910	5,064,909	5,020,101	4,973,440	4,926,839	4,820,724	4,687,569
65-74	8,665,500	8,778,067	8,914,508	9,098,548	9,228,348	9,360,000	9,503,384	9,413,113	9,381,310	9,349,600
75 & up	5,606,400	5,796,041	5,999,657	6,170,463	6,354,298	6,585,600	6,771,465	6,944,814	7,185,508	7,369,200
Total	56,324,668	57,030,368	57,901,569	58,615,577	59,513,620	60,207,532	60,795,855	61,304,150	62,136,169	62,745,181
Increase	630,006	705,701	871,201	714,008	898,042	693,913	588,323	508,294	832,019	609,013

Table 7

Single Family Housing Starts by Year

Period	Starts	Adjusted Starts
1973	1,132,000	
1974	888,000	969,333
1975	892,000	890,667
1976	1,162,000	1,072,000
1977	1,451,000	1,354,667
1978	1,433,000	1,439,000
1979	1,194,000	1,273,667
1980	852,000	966,000
1981	705,000	754,000
1982	663,000	677,000
1983	1,068,000	933,000
1984	1,084,000	1,078,667
1985	1,072,000	1,076,000
1986	1,179,000	1,143,333
1987	1,146,000	1,157,000
1988	1,081,000	1,102,667
1989	1,003,000	1,029,000
1990	895,000	931,000
1991	840,000	858,333
1992	1,030,000	966,667
1993	1,126,000	1,094,000
1994	1,198,000	1,174,000
1995	1,076,000	1,116,667

Source: US Bureau of the Census, Current Construction Reports, Series C20

Table 8

Mobile home Shipments by Year

Period	Homeowner Households 65 to 74	Homeowner Households 75 and up	Total Households 65 and up	Increase in Households 65 and up	Mobile Home Shipments
1974	6,320,152	3,676,174	9,996,326		329,300
1975	6,550,400	3,747,600	10,298,000	301,674	212,700
1976	6,718,218	3,994,451	10,712,669	414,669	246,100
1977	6,927,783	4,109,395	11,037,178	324,509	277,000
1978	7,172,481	4,245,451	11,417,932	380,755	275,900
1979	7,464,562	4,484,982	11,949,544	531,612	277,400
1980	7,807,300	4,652,800	12,460,100	510,556	221,600
1981	7,947,748	4,941,131	12,888,880	428,780	240,900
1982	8,111,495	5,072,884	13,184,379	295,499	239,600
1983	8,257,251	5,222,002	13,479,253	294,874	295,800
1984	8,512,922	5,368,355	13,881,277	402,024	295,600
1985	8,665,500	5,606,400	14,271,900	390,623	283,500
1986	8,778,067	5,796,041	14,574,108	302,208	244,300
1987	8,914,508	5,999,657	14,914,165	340,058	232,800
1988	9,098,548	6,170,463	15,269,011	354,846	218,300
1989	9,228,348	6,354,298	15,582,647	313,636	198,100
1990	9,360,000	6,585,600	15,945,600	362,953	188,300
1991	9,503,384	6,771,465	16,274,849	329,249	170,900
1992	9,413,113	6,944,814	16,357,928	83,078	210,500
1993	9,381,310	7,185,508	16,566,818	208,890	248,250
1994	9,349,600	7,369,200	16,718,800	151,982	286,000

Source: US Bureau of the Census, Current Construction Reports, Series C20

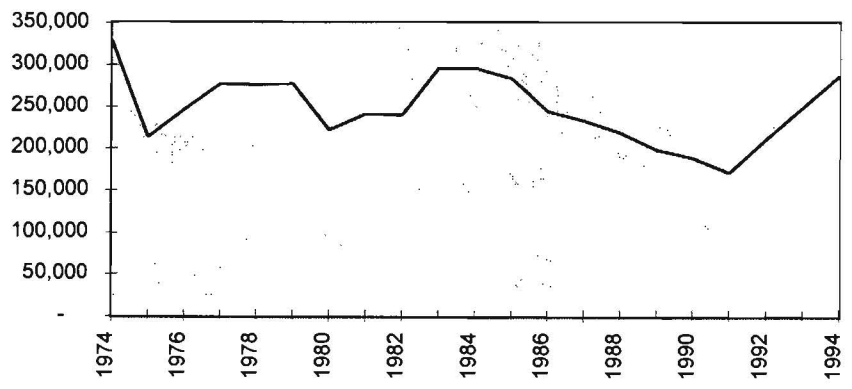


Fig. 4.1: Production of Mobile Homes: 1974 to 1994
Source: Current Construction Reports Series C20

Table 9

Home-ownership Data for Vacation Homes

Age of Householder	Number of Households	Ownership Rate	Computed Total	*American Demographics* Total
Under 35	25,116	1.60%	402	398
35 to 54	38,054	4.20%	1,598	1,588
55 and older	32,890	4.00%	1,316	1,350
			3,316	3336

Source: "Home Sweet Summer Home," *American Demographics*, November 1994.

Table 10

National Vacation Housing Units by Age

Households, in thousands

Age of Householder	**1970**	**1971**	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**
Total	*63,400*	*64,870*	*66,375*	*67,914*	*69,489*	*71,100*	*72,942*	*74,832*	*76,771*	*78,760*	*80,800*	*81,966*	*83,149*	*84,348*
Age of Householder														
15 to 34 years old	16,100	16,930	17,802	18,720	19,685	20,700	21,525	22,386	23,284	24,221	25,200	25,210	25,235	25,275
35 to 54 years old	24,000	24,151	24,307	24,467	24,631	24,800	25,148	25,511	25,891	26,287	26,700	27,315	27,961	28,639
55 and over	23,300	23,739	24,188	24,648	25,118	25,600	26,245	26,907	27,587	28,284	29,000	29,440	29,890	30,350
Second Homes														
15 to 34 years old	258	271	285	300	315	331	344	358	373	388	403	403	404	404
35 to 54 years old	1,008	1,014	1,021	1,028	1,035	1,042	1,056	1,071	1,087	1,104	1,121	1,147	1,174	1,203
55 and over	932	950	968	986	1,005	1,024	1,050	1,076	1,103	1,131	1,160	1,178	1,196	1,214
Total	2,198	2,235	2,273	2,313	2,354	2,397	2,450	2,506	2,563	2,623	2,685	2,728	2,774	2,821
Change in OUH		37	38	40	41	43	54	56	57	60	62	44	46	48
Change in OUH in thousands		37,187	38,464	39,789	41,165	42,595	53,617	55,516	57,487	59,530	61,650	43,589	45,532	47,536

Source: Table 4 multiplied by ownership rates from *American Demographics*

Table 10

Age of Householder	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**
Total	*85,565*	*86,800*	*88,063*	*89,344*	*90,644*	*91,962*	*93,300*	*94,236*	*95,181*	*96,136*	#####
Age of Householder											
15 to 34 years old	25,330	25,400	25,416	25,433	25,453	25,476	25,500	25,365	25,237	25,116	25,000
35 to 54 years old	29,352	30,100	31,031	31,996	32,994	34,029	35,100	36,055	37,040	38,054	39,100
55 and over	30,820	31,300	31,541	31,791	32,051	32,320	32,600	32,690	32,786	32,890	33,000
Second Homes											
15 to 34 years old	405	406	407	407	407	408	408	406	404	402	400
35 to 54 years old	1,233	1,264	1,303	1,344	1,386	1,429	1,474	1,514	1,556	1,598	1,642
55 and over	1,233	1,252	1,262	1,272	1,282	1,293	1,304	1,308	1,311	1,316	1,320
Total	2,871	2,923	2,972	3,022	3,075	3,130	3,186	3,228	3,271	3,316	3,362
Change in OUH	50	52	49	51	53	55	57	42	43	45	46
Change in OUH in thousa	49,604	51,739	48,986	50,790	52,656	54,586	56,582	41,571	43,162	44,795	46,471

Table 11

Comparison of Estimated Housing Demand to Estimated Increase in Vacation Homes

	Estimated Housing Demand	Estimated Increase in Demand	Increase in Vacation Homes
1974	45,203,121		
1975	46,346,672	1,143,551	42,595
1976	47,645,429	1,298,757	53,617
1977	48,792,663	1,147,234	55,516
1978	50,324,095	1,531,432	57,487
1979	51,876,695	1,552,600	59,530
1980	53,365,132	1,488,437	61,650
1981	53,793,574	428,442	43,589
1982	54,254,976	461,402	45,532
1983	54,823,477	568,500	47,536
1984	55,694,662	871,185	49,604
1985	56,324,668	630,006	51,739
1986	57,030,368	705,701	48,986
1987	57,901,569	871,201	50,790
1988	58,615,577	714,008	52,656
1989	59,513,620	898,042	54,586
1990	60,207,532	693,913	56,582
1991	60,795,855	588,323	41,571
1992	61,304,150	508,294	43,162
1993	62,136,169	832,019	44,795
1994	62,745,181	609,013	46,471

Source: Table 6 and Table 10

Table 12

Computation of Percentage of Housing Units Removed from the Housing Stock

	1970	1975	1980	1985	1989	1993		
						3,720		
1980 to 1989				5,534	9,951	9,917		
1970 to 1979		6,527	12,568	14,128	13,829	13,290		
1960 to 1969	10,477	11,667	11,227	10,035	9,963	9,482		
1950 to 1959	10,220	9,958	10,158	9,419	9,351	8,855		
1940 to 1949	4,953	4,984	4,884	5,001	4,929	4,696		
1939 and earlier	14,235	13,731	13,680	12,029	11,892	11,290		
	39,885	46,867	52,517	56,146	59,915	61,250		
Units removed, in thousands								
10-20 years old		262	440	1,192	299	573		
20-30 years old		(31)	(200)	739	72	481		
30-40 years old		504	100	(117)	68	496		
40-50 years old			51	1,651	72	233		
50-60 years old					137	602		
Units Removed, by percent							**Total Percent**	**Annual Percent**
10-20 years old		2.56%	3.77%	10.62%	2.12%	2.41%	21.48%	0.976%
20-30 years old		-0.63%	-2.01%	7.28%	0.72%	4.83%	10.19%	0.463%
30-40 years old		3.54%	2.01%	-2.40%	0.72%	5.30%	9.18%	0.417%
40-50 years old			0.37%	12.07%	1.44%	4.73%	18.61%	0.846%
50-60 years old					1.14%	5.06%	6.20%	0.282%

Source: US Bureau of the Census, American Housing Survey.

Table 13

Computation of Housing Units Removed, 1970 to 1993

	1970	1975	1980	1985	1989	1993	
						3,720	
1980 to 1989				5,534	9,951	9,917	
1970 to 1979		6,527	12,568	14,128	13,829	13,290	
1960 to 1969	10,477	11,667	11,227	10,035	9,963	9,482	
1950 to 1959	10,220	9,958	10,158	9,419	9,351	8,855	
1940 to 1949	4,953	4,984	4,884	5,001	4,929	4,696	
1939 and earlier	14,235	13,731	13,680	12,029	11,892	11,290	
	39,885	46,867	52,517	56,146	59,915	61,250	
Units removed, in thousands							**Percent Removed Annually**
10-20 years old	92,401	105,483	101,505	127,733	125,030	120,157	0.904%
20-30 years old	22,933	46,106	47,032	46,462	46,129	43,902	0.463%
30-40 years old	59,383	20,791	20,374	39,293	39,009	36,940	0.417%
40-50 years old		116,133	115,702	42,297	41,688	39,717	0.846%
50-60 years old				33,906	33,520	31,823	0.282%
	174,716	288,513	284,613	289,692	285,376	272,539	

Source: US Bureau of the Census, American Housing Survey.

Table 14

Estimate of Housing Units Removed

Year	Estimate of Housing Units Removed
1970	**174,716**
1971	197,476
1972	220,235
1973	242,995
1974	265,754
1975	**288,513**
1976	287,733
1977	286,953
1978	286,173
1979	285,393
1980	**284,613**
1981	285,629
1982	286,644
1983	287,660
1984	288,676
1985	**289,692**
1986	311,105
1987	332,518
1988	353,932
1989	**375,345**
1990	349,644
1991	323,942
1992	298,241
1993	**272,539**
1994	246,838

Table 15

Mobile Homes Removed from the Housing Stock

	1980	1985	1989	1993	
Owner-occupied	3,104	3,906	4,406	4,482	
Renter-occupied	785	848	1,033	1,173	
Total	3,889	4,754	5,439	5,655	
Net Additions		865	685	216	1,766
Shipments		1,294	979	615	2,887
Units Removed		429	294	399	1,121
Average Units Removed per year					93.4

Source: US Bureau of the Census, American Housing Survey

Table 16

Determinant Variables in the Demand for Housing

	Estimated Change in Demand	Estimated Housing Removed	Mobile Home Shipments	Housing Starts	Vacation Houses Demanded	Dependent Variable
1974		265,754	329,300	969,333		
1975	1,143,551	288,513	212,700	890,667	42,595	848,072
1976	1,298,757	287,733	246,100	1,072,000	53,617	1,018,383
1977	1,147,234	286,953	277,000	1,354,667	55,516	1,299,150
1978	1,531,432	286,173	275,900	1,439,000	57,487	1,381,513
1979	1,552,600	285,393	277,400	1,273,667	59,530	1,214,137
1980	1,488,437	284,613	221,600	966,000	61,650	904,350
1981	428,442	285,629	240,900	754,000	43,589	710,411
1982	461,402	286,644	239,600	677,000	45,532	631,468
1983	568,500	287,660	295,800	933,000	47,536	885,464
1984	871,185	288,676	295,600	1,078,667	49,604	1,029,063
1985	630,006	289,692	283,500	1,076,000	51,739	1,024,261
1986	705,701	311,105	244,300	1,143,333	48,986	1,094,348
1987	871,201	332,518	232,800	1,157,000	50,790	1,106,210
1988	714,008	353,932	218,300	1,102,667	52,656	1,050,010
1989	898,042	375,345	198,100	1,029,000	54,586	974,414
1990	693,913	349,644	188,300	931,000	56,582	874,418
1991	588,323	323,942	170,900	858,333	41,571	816,763
1992	508,294	298,241	210,500	966,667	43,162	923,504
1993	832,019	272,539	248,250	1,094,000	44,795	1,049,205
1994	609,013	246,838	286,000	1,174,000	46,471	1,127,529

Table 17

Regression Statistics for the Determinants of the Demand for Housing from Table 16

Regression Statistics	
Multiple R	0.755555213
R Square	0.57086368
Adjusted R Square	0.49040062
Standard Error	131512.1802
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	3.6812E+11	1.22707E+11	7.094729933	0.003018202
Residual	16	2.76727E+11	17295453542		
Total	19	6.44847E+11			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-685716.546	597864.5016	-1.146936156	0.268270617	-1953128.252	581703.4258
Demographic Demand	0.26779499	0.084626192	3.164443332	0.006010219	0.088395317	0.447194263
Housing Removed	2.23874201	1.288661427	1.737252828	0.101550282	-0.493108862	4.97057028
Mobile Home Shipmen	3.18658404	1.08661313	2.932580935	0.009757739	0.883064536	5.490097361

Table 18

Projections of Households by Age of Householder, 1995 to 2005

Age of householder	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	97,722,883	98,856,603	99,965,175	101,042,864	102,118,600	103,245,963	104,344,445	105,456,124	106,566,127	107,672,899	108,818,659
Under 25 years	4,826,422	4,712,158	4,699,653	4,757,876	4,853,767	4,966,404	5,091,884	5,189,858	5,289,788	5,354,326	5,398,630
25 to 29 years	7,954,321	7,957,658	7,889,119	7,768,887	7,593,297	7,411,228	7,203,807	7,168,063	7,228,437	7,371,091	7,550,822
30 to 34 years	10,828,763	10,570,450	10,270,289	9,976,774	9,742,411	9,633,941	9,639,162	9,559,421	9,418,921	9,212,378	8,995,778
35 to 44 years	22,756,496	23,183,301	23,516,798	23,766,619	23,915,505	23,913,799	23,777,022	23,487,486	23,150,516	22,846,544	22,560,079
45 to 54 years	17,722,949	18,449,029	19,179,155	19,727,324	20,433,561	21,209,525	22,056,714	22,407,059	22,916,971	23,420,242	23,923,589
55 to 64 years	12,330,779	12,464,083	12,735,252	13,236,547	13,658,068	14,001,868	14,318,251	15,239,967	15,949,721	16,642,660	17,330,619
65 to 74 years	11,849,494	11,796,570	11,681,972	11,587,631	11,475,046	11,446,183	11,421,208	11,398,805	11,424,493	11,502,174	11,597,383
75 years and over	9,453,659	9,723,354	9,992,937	10,221,206	10,446,945	10,663,015	10,836,397	11,005,465	11,187,280	11,323,484	11,461,759

Source: US Bureau of the Census, Current Population Reports, Series C20.

Table 19

Projections of Resident Population, by Age

Age	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	262,798	264,869	266,733	268,396	269,861	271,237	272,528	273,742	274,885	275,965	276,990
Under 5	19,590	19,282	18,945	18,626	18,295	17,943	17,683	17,447	17,236	17,048	16,896
5-9	19,212	19,541	19,818	19,961	19,962	19,790	19,470	19,124	18,797	18,470	18,123
10-14	18,918	19,079	19,162	19,296	19,580	19,900	20,218	20,491	20,633	20,634	20,467
15-19	18,071	18,553	18,952	19,320	19,499	19,608	19,746	19,816	19,938	20,231	20,561
20-24	17,875	17,332	17,209	17,311	17,587	17,970	18,395	18,759	19,097	19,257	19,374
25-29	18,981	18,977	18,780	18,444	17,959	17,454	16,883	16,726	16,795	17,060	17,417
30-34	21,881	21,348	20,719	20,086	19,559	19,287	19,242	19,021	18,674	18,188	17,677
35-39	22,280	22,520	22,565	22,502	22,370	22,010	21,448	20,794	20,147	19,620	19,347
40-44	20,234	20,763	21,292	21,754	22,079	22,354	22,567	22,594	22,519	22,377	22,018
45-49	17,455	18,410	18,417	18,767	19,224	19,707	20,205	20,707	21,142	21,454	21,720
50-54	13,636	13,911	15,125	15,665	16,356	17,133	18,010	18,016	18,353	18,793	19,273
55-59	11,088	11,350	11,732	12,362	12,810	13,223	13,464	14,609	15,156	15,854	16,560
60-64	10,048	9,991	10,040	10,223	10,450	10,575	10,822	11,181	11,780	12,193	12,584
65-74	18,753	18,663	18,465	18,286	18,068	17,974	17,885	17,798	17,784	17,850	17,943
75-84	11,145	11,419	11,680	11,851	12,019	12,162	12,252	12,341	12,439	12,459	12,465
85 and up	3,630	3,731	3,831	3,943	4,044	4,148	4,238	4,319	4,395	4,477	4,566

Source: US Bureau of the Census, Current Population Reports, Series C20.

Table 20

Projections of Households by Age of Householder, 1995 to 2005 (Revised)

Age of householder	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	97,722,883	98,856,603	99,965,175	101,042,864	102,118,600	103,245,963	104,344,445	105,456,124	106,566,127	107,672,899	108,818,659
Under 25 years	4,826,422	4,712,158	4,699,653	4,757,876	4,853,767	4,966,404	5,091,884	5,189,858	5,289,788	5,354,326	5,398,630
25 to 29 years	7,954,321	7,957,658	7,889,119	7,768,887	7,593,297	7,411,228	7,203,807	7,168,063	7,228,437	7,371,091	7,550,822
30 to 34 years	10,828,763	10,570,450	10,270,289	9,976,774	9,742,411	9,633,941	9,639,162	9,559,421	9,418,921	9,212,378	8,995,778
35 to 39 years	11,925,665	12,062,168	12,099,605	12,084,092	12,036,146	11,863,965	11,586,042	11,256,640	10,931,741	10,673,289	10,551,548
40 to 44 years	10,830,831	11,121,133	11,417,193	11,682,527	11,879,359	12,049,834	12,190,980	12,230,846	12,218,775	12,173,255	12,008,531
45 to 49 years	9,949,951	10,508,600	10,530,576	10,752,510	11,040,306	11,345,690	11,661,814	11,982,061	12,267,655	12,484,415	12,675,809
50 to 54 years	7,772,998	7,940,429	8,648,579	8,974,814	9,393,255	9,863,835	10,394,900	10,424,998	10,649,316	10,935,827	11,247,780
55 to 59 years	6,468,860	6,628,675	6,862,332	7,245,026	7,521,786	7,779,876	7,938,027	8,632,826	8,974,562	9,407,336	9,847,486
60 to 64 years	5,861,919	5,835,408	5,872,920	5,991,521	6,136,282	6,221,992	6,380,224	6,607,141	6,975,159	7,235,324	7,483,133
65 to 74 years	11,849,494	11,796,570	11,681,972	11,587,631	11,475,046	11,446,183	11,421,208	11,398,805	11,424,493	11,502,174	11,597,383
75 years and over	9,453,659	9,723,354	9,992,937	10,221,206	10,446,945	10,663,015	10,836,397	11,005,465	11,187,280	11,323,484	11,461,759

Source: Revised from US Bureau of the Census, Current Population Reports, Series C20.

Table 21

National Homeownership Rates by Age

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
National	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*
< 25	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
25-29	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
30-34	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
35-39	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1
40-44	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6
45-49	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7
50-54	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0
55-59	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8
60-64	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3
65-69	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
70-74	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
75 & up	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5

Source: 1995 Data from the National Association of Home Builders.

Table 22

National Housing Units Demanded by Age and Total

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
< 25		767,401	749,233	747,245	756,502	771,749	789,658	809,610	825,187	841,076	851,338	858,382
25-29		2,736,286	2,737,434	2,713,857	2,672,497	2,612,094	2,549,462	2,478,110	2,465,814	2,486,582	2,535,655	2,597,483
30-34		5,750,073	5,612,909	5,453,523	5,297,667	5,173,220	5,115,623	5,118,395	5,076,053	5,001,447	4,891,773	4,776,758
35-39		7,405,838	7,490,606	7,513,855	7,504,221	7,474,447	7,367,522	7,194,932	6,990,374	6,788,611	6,628,113	6,552,511
40-44		7,429,950	7,629,098	7,832,194	8,014,213	8,149,240	8,266,186	8,363,012	8,390,360	8,382,079	8,350,853	8,237,852
45-49		7,333,114	7,744,838	7,761,035	7,924,600	8,136,706	8,361,773	8,594,757	8,830,779	9,041,262	9,201,014	9,342,071
50-54		5,985,208	6,114,130	6,659,406	6,910,607	7,232,806	7,595,153	8,004,073	8,027,248	8,199,973	8,420,586	8,660,791
55-59		5,097,462	5,223,396	5,407,518	5,709,080	5,927,167	6,130,543	6,255,165	6,802,667	7,071,955	7,412,981	7,759,819
60-64		4,707,121	4,685,833	4,715,954	4,811,192	4,927,435	4,996,259	5,123,320	5,305,534	5,601,053	5,809,965	6,008,956
65-74		9,592,165	9,549,323	9,456,556	9,380,187	9,289,050	9,265,685	9,245,468	9,227,333	9,248,127	9,311,010	9,388,082
75 & up		6,948,439	7,146,665	7,344,809	7,512,586	7,678,505	7,837,316	7,964,752	8,089,017	8,222,651	8,322,761	8,424,393
Total	62,745,181	63,753,058	64,683,466	65,605,952	66,493,353	67,372,418	68,275,181	69,151,593	70,030,365	70,884,817	71,736,048	72,607,098
Increase		1,007,877	930,407	922,486	887,401	879,065	902,763	876,412	878,772	854,452	851,231	871,049

Source: Table 21 multiplied by Table 20

Table 23

Computation of Owner-occupied Housing Units Removed from the Housing Stock

	1995			Adjusted Number	**2000**			Adjusted Number	**2005**	
	8,511,000									
10-20 years old	11,603,500	113,283	566,413	11,037,087	11,320,294	110,518	552,588	10,767,705	13,894,853	135,653
20-30 years old	11,386,000	52,718	263,588	11,122,412	11,079,750	51,300	256,498	10,823,251	10,795,478	49,983
30-40 years old	9,168,500	38,248	191,238	8,977,262	10,049,837	41,924	209,621	9,840,215	10,331,733	43,100
40-50 years old	8,855,000	74,893	374,465	8,480,535	8,728,898	73,827	369,133	8,359,766	9,099,990	76,965
50-60 years old	11,558,500	32,580	162,900	11,395,600	15,635,868	44,073	220,364	15,415,503	19,595,386	55,234
		311,721				321,641				360,935

Percent Removed	**Annual Percent**
10-20 years old	0.976%
20-30 years old	0.463%
30-40 years old	0.417%
40-50 years old	0.846%
50-60 years old	0.282%

Source: 1995 Data Extracted from 1993 American Housing Survey

Table 24

Estimate of Housing Units Removed from the Housing Stock, 1995 to 2005

Year	Estimate of Units Removed
1995	**311,721**
1996	313,705
1997	315,689
1998	317,673
1999	319,657
2000	**321,641**
2001	329,500
2002	337,359
2003	345,217
2004	353,076
2005	**360,935**

Source: Table B6

Table25

Projected Demand for Vacation Homes, 1995 to 2005

Age of Householder	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Total	*97,100*	97,722,883	98,856,603	99,965,175	101,042,864	102,118,600	103,245,963	104,344,445	105,456,124	106,566,127	107,672,899	108,818,659
Age of Householder												
15 to 34 years old	25,000,000	23,609,506	23,240,266	22,859,061	22,503,537	22,189,475	22,011,573	21,934,853	21,917,342	21,937,146	21,937,795	21,945,230
35 to 54 years old	39,100,000	40,479,445	41,632,330	42,695,953	43,493,943	44,349,066	45,123,324	45,833,736	45,894,545	46,067,487	46,266,786	46,483,668
55 and over	33,000,000	33,633,932	33,984,007	34,410,161	35,045,384	35,580,059	36,111,066	36,575,856	37,644,237	38,561,494	39,468,318	40,389,761
Second Homes												
15 to 34 years old	400,000	377,752	371,844	365,745	360,057	355,032	352,185	350,958	350,677	350,994	351,005	351,124
35 to 54 years old	1,642,200	1,700,137	1,748,558	1,793,230	1,826,746	1,862,661	1,895,180	1,925,017	1,927,571	1,934,834	1,943,205	1,952,314
55 and over	1,320,000	1,345,357	1,359,360	1,376,406	1,401,815	1,423,202	1,444,443	1,463,034	1,505,769	1,542,460	1,578,733	1,615,590
Total	3,362,200	3,423,246	3,479,762	3,535,381	3,588,618	3,640,895	3,691,807	3,739,009	3,784,018	3,828,289	3,872,942	3,919,028
Change in OUH		61,046	56,516	55,619	53,236	52,277	50,913	47,201	45,009	44,271	44,654	46,086

Source: Household information from Table 20, home-ownership rates from Table 4.3

Table 26

Estimate of Housing Starts Assuming Constant Home-ownership Rates and Constant Mobile Home Production

Year	OOHU Demanded	Change in OOHU	Housing Units Removed	Mobile Home Shipments	Change in OUH	Dependent Variable	Housing Starts
1994	62,745,181						
1995	63,753,058	1,007,877	311,721	286,000	61,046	1,193,413	1,254,460
1996	64,683,466	930,407	313,705	286,000	56,516	1,177,109	1,233,625
1997	65,605,952	922,486	315,689	286,000	55,619	1,179,430	1,235,049
1998	66,493,353	887,401	317,673	286,000	53,236	1,174,476	1,227,712
1999	67,372,418	879,065	319,657	286,000	52,277	1,176,685	1,228,962
2000	68,275,181	902,763	321,641	286,000	50,913	1,187,473	1,238,386
2001	69,151,593	876,412	329,500	286,000	47,201	1,198,010	1,245,212
2002	70,030,365	878,772	337,359	286,000	45,009	1,216,236	1,261,245
2003	70,884,817	854,452	345,217	286,000	44,271	1,227,317	1,271,588
2004	71,736,048	851,231	353,076	286,000	44,654	1,244,048	1,288,702
2005	72,607,098	871,049	360,935	286,000	46,086	1,266,949	1,313,035

Intercept	-685716.55
Demographic Demand	0.26779499
Housing Removed	2.23874201
Mobile Home Shipments	3.18658404

Table 27

Projections of Households by Age of Householder, 1995 to 2005

Age of householder	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	97,722,883	98,856,603	99,965,175	101,042,864	102,118,600	103,245,963	104,344,445	105,456,124	106,566,127	107,672,899	108,818,659
Under 25 years	4,826,422	4,712,158	4,699,653	4,757,876	4,853,767	4,966,404	5,091,884	5,189,858	5,289,788	5,354,326	5,398,630
25 to 29 years	7,954,321	7,957,658	7,889,119	7,768,887	7,593,297	7,411,228	7,203,807	7,168,063	7,228,437	7,371,091	7,550,822
30 to 34 years	10,828,763	10,570,450	10,270,289	9,976,774	9,742,411	9,633,941	9,639,162	9,559,421	9,418,921	9,212,378	8,995,778
35 to 39 years	11,925,665	12,062,168	12,099,605	12,084,092	12,036,146	11,863,965	11,586,042	11,256,640	10,931,741	10,673,289	10,551,548
40 to 44 years	10,830,831	11,121,133	11,417,193	11,682,527	11,879,359	12,049,834	12,190,980	12,230,846	12,218,775	12,173,255	12,008,531
45 to 49 years	9,949,951	10,508,600	10,530,576	10,752,510	11,040,306	11,345,690	11,661,814	11,982,061	12,267,655	12,484,415	12,675,809
50 to 54 years	7,772,998	7,940,429	8,648,579	8,974,814	9,393,255	9,863,835	10,394,900	10,424,998	10,649,316	10,935,827	11,247,780
55 to 59 years	6,468,860	6,628,675	6,862,332	7,245,026	7,521,786	7,779,876	7,938,027	8,632,826	8,974,562	9,407,336	9,847,486
60 to 64 years	5,861,919	5,835,408	5,872,920	5,991,521	6,136,282	6,221,992	6,380,224	6,607,141	6,975,159	7,235,324	7,483,133
65 to 74 years	11,849,494	11,796,570	11,681,972	11,587,631	11,475,046	11,446,183	11,421,208	11,398,805	11,424,493	11,502,174	11,597,383
75 years and over	9,453,659	9,723,354	9,992,937	10,221,206	10,446,945	10,663,015	10,836,397	11,005,465	11,187,280	11,323,484	11,461,759

Source: US Bureau of the Census, Current Population Reports, Series C20.

Table 28

National Homeownership Rates by Age

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
National	*64.6*	*64.6*	*64.7*	*64.8*	*65.0*	*65.2*	*65.6*	*65.3*	*64.7*	*64.7*	*64.4*	*63.9*	*63.8*	*64.0*	*63.8*	*63.9*	*63.9*
< 25	19.3	19.3	19.3	19.3	19.4	19.4	19.6	19.5	19.3	18.8	17.9	17.2	17.2	16.0	15.8	16.6	15.7
25-29	42.9	43.1	43.2	42.6	43.9	44.0	43.3	41.3	38.6	38.3	38.6	37.7	36.7	36.4	35.9	35.3	35.2
30-34	61.7	62.2	62.4	62.3	62.6	61.7	61.1	58.8	57.1	55.4	54.8	54.0	53.6	53.5	53.2	53.2	51.8
35-39	69.6	69.0	68.9	69.1	69.8	70.4	70.9	68.8	67.6	66.5	66.1	65.4	64.8	64.1	63.6	63.4	63.0
40-44	73.5	73.9	74.0	73.8	74.5	74.9	74.2	73.6	73.0	72.8	72.3	71.4	70.5	70.8	70.7	70.2	69.8
45-49	76.5	77.1	77.1	76.8	77.0	76.9	76.8	76.1	76.0	75.3	74.6	74.3	74.1	74.6	74.4	74.1	73.9
50-54	76.3	77.2	77.7	78.5	77.6	78.3	78.5	78.0	78.8	78.8	78.4	77.5	78.1	77.8	77.1	77.2	76.8
55-59	77.3	77.7	78.0	76.9	77.9	78.6	79.6	79.7	80.0	80.1	80.1	79.2	80.0	80.0	79.3	79.1	78.8
60-64	75.2	76.3	76.2	77.4	77.7	77.8	78.8	79.7	80.1	79.8	79.9	79.9	79.8	80.4	79.8	80.1	79.8
65-69	73.1	73.6	73.6	74.0	74.7	75.8	77.3	77.5	77.9	78.1	79.3	79.5	79.4	79.5	80.0	80.0	80.0
70-74	69.7	69.4	71.5	71.1	71.0	72.5	72.7	75.2	75.2	75.4	75.5	76.8	77.2	77.7	77.7	77.8	78.4
75 & up	66.8	67.3	67.2	67.2	67.9	67.4	67.8	70.0	71.0	71.9	71.5	69.8	70.0	70.8	70.8	71.2	72.3

Source: National Association of Home Builders

Table 28

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
National	*64.1*	*64.1*	*64.0*	*64.0*	*64.8*										
< 25	15.3	14.9	14.8	14.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
25-29	33.8	33.6	33.6	34.1	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
30-34	51.2	50.5	50.8	50.6	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
35-39	62.2	61.4	61.8	61.2	62.1	61.1	60.5	60.1	59.1	60.1	60.1	60.1	60.1	60.1	60.1
40-44	69.5	69.1	68.6	68.2	68.6	67.4	66.0	66.0	65.9	65.4	64.4	63.7	63.3	62.3	63.3
45-49	73.7	74.2	73.7	73.8	73.7	72.7	71.7	71.3	70.9	70.5	69.3	67.9	67.8	67.7	67.2
50-54	76.1	76.2	77.2	76.8	77.0	76.2	76.0	75.6	75.2	74.8	73.8	72.8	72.3	72.0	71.6
55-59	79.5	79.3	78.9	78.4	78.8	78.8	78.8	78.8	78.8	78.6	77.7	77.6	77.2	76.7	76.3
60-64	80.5	81.2	80.9	80.1	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.1
65-69	81.4	80.8	80.7	80.6	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
70-74	78.8	79.0	79.9	80.1	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
75 & up	73.1	73.3	73.3	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5

Table 29

Changes in Home-ownership Rates after the Baby Boomers Enter an Age Group

	Under 25	25-29	30-34	35-39	40-44	45-49	% Change	% of prior year
				68.9	73.6	74.1		
				69.1	73.0	74.6	0.05%	100.05%
				69.8	72.8	74.4	0.14%	100.14%
			61.7	70.4	72.3	74.1	-0.09%	99.91%
			62.2	70.9	71.4	73.9	-0.04%	99.96%
1			62.4	68.8	70.5	73.7	-1.08%	98.92%
2			62.3	67.6	70.8	74.2	-0.18%	99.82%
3			62.6	66.5	70.7	73.7	-0.51%	99.49%
4		42.9	61.7	66.1	70.2	73.8	-0.62%	99.38%
5		43.1	61.1	65.4	69.8	73.7	-0.51%	99.49%
6		43.2	58.8	64.8	69.5		-1.29%	98.71%
7		42.6	57.1	64.1	69.1		-1.44%	98.56%
8		43.9	55.4	63.6	68.6		-0.60%	99.40%
9	19.3	44.0	54.8	63.4	68.2		-0.48%	99.52%
10	19.3	43.3	54.0	63.0	68.6		-0.60%	99.40%
11	19.3	41.3	53.6	62.2			-1.77%	98.23%
12	19.3	38.6	53.5	61.4			-2.02%	97.98%
13	19.4	38.3	53.2	61.8			-0.08%	99.92%
14	19.4	38.6	53.2	61.2			-0.14%	99.86%
15	19.6	37.7	51.8	62.1			-0.74%	99.26%
16	19.5	36.7	51.2				-1.55%	98.45%
17	19.3	36.4	50.5				-1.10%	98.90%
18	18.8	35.9	50.8				-0.66%	99.34%
19	17.9	35.3	50.6				-1.61%	98.39%
20	17.2	35.2	53.1				1.64%	101.64%
21	17.2	33.8					-2.67%	97.33%
22	16.0	33.6						
						Average	-0.86%	

Source: Data extracted from Table 29

Table 30

National Housing Units Demanded by Age
Assuming Home-ownership Rates Affected by Baby Boomers

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
National		*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*	*64.8*
< 25		767,401	749,233	747,245	756,502	771,749	789,658	809,610	825,187	841,076	851,338	858,382
25-29		2,736,286	2,737,434	2,713,857	2,672,497	2,612,094	2,549,462	2,478,110	2,465,814	2,486,582	2,535,655	2,597,483
30-34		5,750,073	5,612,909	5,453,523	5,297,667	5,173,220	5,115,623	5,118,395	5,076,053	5,001,447	4,891,773	4,776,758
35-39		7,405,838	7,374,502	7,316,019	7,262,068	7,116,799	7,130,037	6,963,211	6,765,241	6,569,977	6,414,647	6,341,480
40-44		7,429,950	7,494,062	7,538,154	7,707,169	7,826,051	7,879,616	7,848,349	7,787,399	7,732,257	7,579,426	7,599,485
45-49		7,333,114	7,644,930	7,550,600	7,663,472	7,830,819	7,999,141	8,076,491	8,130,656	8,317,791	8,452,910	8,518,988
50-54		5,985,208	6,048,098	6,575,626	6,788,867	7,061,337	7,377,277	7,674,175	7,585,567	7,702,296	7,871,554	8,047,520
55-59		5,097,462	5,223,396	5,407,518	5,709,080	5,927,167	6,113,377	6,170,284	6,698,278	6,927,920	7,216,975	7,516,114
60-64		4,707,121	4,685,833	4,715,954	4,811,192	4,927,435	4,996,259	5,123,320	5,305,534	5,601,053	5,809,965	5,992,131
65-74		9,592,165	9,549,323	9,456,556	9,380,187	9,289,050	9,265,685	9,245,468	9,227,333	9,248,127	9,311,010	9,388,082
75 & up		6,948,439	7,146,665	7,344,809	7,512,586	7,678,505	7,837,316	7,964,752	8,089,017	8,222,651	8,322,761	8,424,393
Total	62,745,181	63,753,058	64,266,385	64,819,863	65,561,289	66,214,226	67,053,451	67,472,164	67,956,079	68,651,178	69,258,014	70,060,815
Increase		1,007,877	513,327	553,477	741,426	652,938	839,225	418,713	483,914	695,099	606,837	802,801

Source: Table 27 multiplied by Table 28

Table 31

Estimate of Housing Starts Assuming Changing Home-ownership Rates

Year	Change in OOHU	Housing Units Removed	Mobile Home Shipments	Change in OUH	Dependent Variable	Housing Starts
1994						
1995	1,007,877	311,721	286,000	61,046	1,193,413	1,254,460
1996	513,327	313,705	286,000	56,516	1,065,417	1,121,933
1997	553,477	315,689	286,000	55,619	1,080,611	1,136,230
1998	741,426	317,673	286,000	53,236	1,135,384	1,188,620
1999	652,938	319,657	286,000	52,277	1,116,129	1,168,406
2000	839,225	321,641	286,000	50,913	1,170,458	1,221,371
2001	418,713	329,500	286,000	47,201	1,075,441	1,122,642
2002	483,914	337,359	286,000	45,009	1,110,495	1,155,504
2003	695,099	345,217	286,000	44,271	1,184,643	1,228,914
2004	606,837	353,076	286,000	44,654	1,178,601	1,223,255
2005	802,801	360,935	286,000	46,086	1,248,673	1,294,759

Intercept	-685716.546
Demographic Demand	0.26779499
Housing Removed	2.23874201
Mobile Home Shipments	3.18658404

Table 32

National Homeownership Rates by Age, Assuming Increasing Demand from the Baby Boomers

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
National	*64.6*	*64.6*	*64.7*	*64.8*	*65.0*	*65.2*	*65.6*	*65.3*	*64.7*	*64.7*	*64.4*	*63.9*	*63.8*	*64.0*	*63.8*	*63.9*	*63.9*
< 25	19.3	19.3	19.3	19.3	19.4	19.4	19.6	19.5	19.3	18.8	17.9	17.2	17.2	16.0	15.8	16.6	15.7
25-29	42.9	43.1	43.2	42.6	43.9	44.0	43.3	41.3	38.6	38.3	38.6	37.7	36.7	36.4	35.9	35.3	35.2
30-34	61.7	62.2	62.4	62.3	62.6	61.7	61.1	58.8	57.1	55.4	54.8	54.0	53.6	53.5	53.2	53.2	51.8
35-39	69.6	69.0	68.9	69.1	69.8	70.4	70.9	68.8	67.6	66.5	66.1	65.4	64.8	64.1	63.6	63.4	63.0
40-44	73.5	73.9	74.0	73.8	74.5	74.9	74.2	73.6	73.0	72.8	72.3	71.4	70.5	70.8	70.7	70.2	69.8
45-49	76.5	77.1	77.1	76.8	77.0	76.9	76.8	76.1	76.0	75.3	74.6	74.3	74.1	74.6	74.4	74.1	73.9
50-54	76.3	77.2	77.7	78.5	77.6	78.3	78.5	78.0	78.8	78.8	78.4	77.5	78.1	77.8	77.1	77.2	76.8
55-59	77.3	77.7	78.0	76.9	77.9	78.6	79.6	79.7	80.0	80.1	80.1	79.2	80.0	80.0	79.3	79.1	78.8
60-64	75.2	76.3	76.2	77.4	77.7	77.8	78.8	79.7	80.1	79.8	79.9	79.9	79.8	80.4	79.8	80.1	79.8
65-69	73.1	73.6	73.6	74.0	74.7	75.8	77.3	77.5	77.9	78.1	79.3	79.5	79.4	79.5	80.0	80.0	80.0
70-74	69.7	69.4	71.5	71.1	71.0	72.5	72.7	75.2	75.2	75.4	75.5	76.8	77.2	77.7	77.7	77.8	78.4
75 & up	66.8	67.3	67.2	67.2	67.9	67.4	67.8	70.0	71.0	71.9	71.5	69.8	70.0	70.8	70.8	71.2	72.3

Source: 1974 to 1995 Data from the National Association of Home Builders

Table 32

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
National	*64.1*	*64.1*	*64.0*	*64.0*	*64.8*										
< 25	15.3	14.9	14.8	14.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
25-29	33.6	33.6	33.6	34.1	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
30-34	51.2	50.5	50.8	50.6	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
35-39	62.2	61.4	61.8	61.2	62.1	61.1	60.5	60.1	59.1	60.1	60.1	60.1	60.1	60.1	60.1
40-44	69.5	69.1	68.6	68.2	68.6	67.4	66.0	66.0	65.9	65.4	64.4	63.7	63.3	62.3	63.3
45-49	73.7	74.2	73.7	73.8	73.7	72.7	71.7	71.3	70.9	70.5	69.3	67.9	67.8	67.7	67.2
50-54	76.1	76.2	77.2	76.8	77.0	76.2	76.2	76.5	76.8	77.2	77.5	77.8	78.2	78.5	78.8
55-59	79.5	79.3	78.9	78.4	78.8	78.8	78.8	78.8	78.8	78.6	77.7	77.7	78.1	78.4	78.7
60-64	80.5	81.2	80.9	80.1	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.3	80.1
65-69	81.4	80.8	80.7	80.6	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
70-74	78.8	79.0	79.9	80.1	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
75 & up	73.1	73.3	73.3	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5

Table 33

National Housing Units Demanded by Age
Assuming Home-ownership Rates Increased by Baby Boomers

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
National		64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
< 25		767,401	749,233	747,245	756,502	771,749	789,658	809,610	825,187	841,076	851,338	858,382
25-29		2,736,286	2,737,434	2,713,857	2,672,497	2,612,094	2,549,462	2,478,110	2,465,814	2,486,582	2,535,655	2,597,483
30-34		5,750,073	5,612,909	5,453,523	5,297,667	5,173,220	5,115,623	5,118,395	5,076,053	5,001,447	4,891,773	4,776,758
35-39		7,405,838	7,374,502	7,316,019	7,262,068	7,116,799	7,130,037	6,963,211	6,765,241	6,569,977	6,414,647	6,341,480
40-44		7,429,950	7,494,062	7,538,154	7,707,169	7,826,051	7,879,616	7,848,349	7,787,399	7,732,257	7,579,426	7,599,485
45-49		7,333,114	7,644,930	7,550,600	7,663,472	7,830,819	7,999,141	8,076,491	8,130,656	8,317,791	8,452,910	8,518,988
50-54		5,985,208	6,048,098	6,575,626	6,788,867	7,061,337	7,377,277	7,674,175	7,585,567	7,702,296	7,871,554	8,047,520
55-59		5,097,462	5,223,396	5,407,518	5,709,080	5,927,167	6,113,377	6,170,284	6,698,278	6,927,920	7,216,975	7,516,114
60-64		4,707,121	4,685,833	4,715,954	4,811,192	4,927,435	4,996,259	5,123,320	5,305,534	5,601,053	5,809,965	5,992,131
65-74		9,592,165	9,549,323	9,456,556	9,380,187	9,289,050	9,265,685	9,245,468	9,227,333	9,248,127	9,311,010	9,388,082
75 & up		6,948,439	7,146,665	7,344,809	7,512,586	7,678,505	7,837,316	7,964,752	8,089,017	8,222,651	8,322,761	8,424,393
Total	62,745,181	63,753,058	64,266,385	64,819,863	65,561,289	66,214,226	67,053,451	67,472,164	67,956,079	68,651,178	69,258,014	70,060,815
Increase		1,007,877	513,327	553,477	741,426	652,938	839,225	418,713	483,914	695,099	606,837	802,801

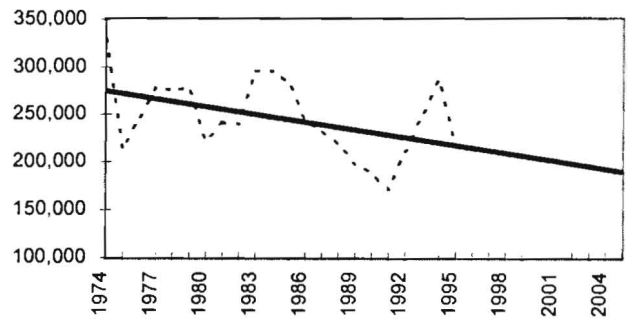
Year	Change in OOHU	Housing Units Removed	Mobile Home Shipments	Change in OUH	Dependent Variable	Housing Starts
1994						
1995	1,007,877	311,721	286,000	61,046	1,193,413	1,254,460
1996	513,327	313,705	286,000	56,516	1,065,417	1,121,933
1997	553,477	315,689	286,000	55,619	1,080,611	1,136,230
1998	741,426	317,673	286,000	53,236	1,135,384	1,188,620
1999	652,938	319,657	286,000	52,277	1,116,129	1,168,406
2000	839,225	321,641	286,000	50,913	1,170,458	1,221,371
2001	418,713	329,500	286,000	47,201	1,075,441	1,122,642
2002	483,914	337,359	286,000	45,009	1,110,495	1,155,504
2003	695,099	345,217	286,000	44,271	1,184,643	1,228,914
2004	606,837	353,076	286,000	44,654	1,178,601	1,223,255
2005	802,801	360,935	286,000	46,086	1,248,673	1,294,759

Intercept	-685716.546
Demographic Demand	0.26779499
Housing Removed	2.23874201
Mobile Home Shipments	3.18658404

Table 35

Prediction of Mobile Home Shipments Assuming a Linear Trend

1974	329,300
1975	212,700
1976	246,100
1977	277,000
1978	275,900
1979	277,400
1980	221,600
1981	240,900
1982	239,600
1983	295,800
1984	295,600
1985	283,500
1986	244,300
1987	232,800
1988	218,300
1989	198,100
1990	188,300
1991	170,900
1992	210,500
1993	248,250
1994	286,000
1995	217,235
1996	214,504
1997	211,773
1998	209,041
1999	206,310
2000	203,579
2001	200,848
2002	198,116
2003	195,385
2004	192,654
2005	189,923



Mobile Home Shipments, Actual 1974 to 1994, predicted Assuming a Linear Trend, 1995 to 2005 *Source: Table C9*

Table 36

Estimate of Housing Starts Assuming Constant Home-ownership Rates and Changing Mobile Home Production

Year	OOHU Demanded	Change in OOHU	Housing Units Removed	Mobile Home Shipments	Change in OUH	Dependent Variable	Housing Starts
1994	62,745,181						
1995	63,753,058	1,007,877	311,721	217,235	61,046	974,288	1,035,334
1996	64,683,466	930,407	313,705	214,504	56,516	949,280	1,005,797
1997	65,605,952	922,486	315,689	211,773	55,619	942,898	998,517
1998	66,493,353	887,401	317,673	209,041	53,236	929,240	982,477
1999	67,372,418	879,065	319,657	206,310	52,277	922,746	975,024
2000	68,275,181	902,763	321,641	203,579	50,913	924,831	975,744
2001	69,151,593	876,412	329,500	200,848	47,201	926,665	973,866
2002	70,030,365	878,772	337,359	198,116	45,009	936,187	981,196
2003	70,884,817	854,452	345,217	195,385	44,271	938,565	982,836
2004	71,736,048	851,231	353,076	192,654	44,654	946,593	991,247
2005	72,607,098	871,049	360,935	189,923	46,086	960,791	1,006,876

Intercept	-685716.55
Demographic Demand	0.26779499
Housing Removed	2.23874201
Mobile Home Shipments	3.18658404

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